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ART. 1.—*Phlebitis, or Inflammation of the Veins.* By GEO. B. LORING, M.D.

THIS disease, so formidable in its nature, and so general, was unknown to medical writers until the acuteness of Mr. Hunter brought it forth, and by ingenious experiments proved its existence, and its effects upon the constitution. In a paper published in 1793, in the "Transactions of a Society for the Improvement of Medical and Chirurgical Knowledge," he opens the way into this new branch of medical science. Having observed, in violent cellular inflammation from any cause, that the veins take on an inflamed state also, and become suppurated, adhered, or ulcerated; that they form, unless obstructed by adhesion, an open passage for pus to the heart, but by their obstruction cause abscesses; and that where the inflammation is strongest in the vein, the pus is purest, becoming mixed with blood and coagulum as the passage approaches or recedes from the heart; he inferred that a great source of evil in amputations, compound fractures, and mortification, might be found in a morbid action of the veins. He found the same appearances in fatal cases after venesection, and attributed the effects met with, to an inflammation of the opened vein, instead of looking to wounded tendons and nerves, as his predecessors had done. Constant observation on subjects, living and dead, convinced him of the truth of his proposition so strongly, that he was disposed to attribute to the large veins the extent or spread of all inflammations beyond the bound of continued sympathy.

The path thus pointed out by this great man, was followed by Abernethy, Clarke, Wilson, and others, who gathered strength for the theory by constant, conclusive experiments. Still little was known of Hunter's researches among French pathologists, until 1815, when Mr. Hodgson published his treatise on diseases of the arteries and veins, a valuable work, followed by those of Travers and Carmichael. These treatises served to bring forward the discoveries of Hunter, and introduce a new system of pathology to all those who had followed the school of Pinel, and obstinately adhered to doctrines, whose chief merit consisted in being opposed to the blind humorism of the ancients. Clear and simple as it is, Cruveilhier found in it the link which unites this theory of old pathologists, with the rational system of the moderns; and to him it presented a truth and power capable of ruling in some manner the entire pathological doctrine of the present day; offering a solution of a crowd of phenomena, which escaped all explanation as well as all theory. With him, it belongs equally to medicine and surgery, being traumatic and spontaneous, according to circumstances, which will be shown hereafter in the causes of phlebitis.

That the effect, general and local, upon the system, of inflammation of the veins should be immense, and powerfully prostrating, cannot be wondered at, when we consider the vast extent of surface occupied by the lining membrane of these organs, greater probably than that of any other shut sac in the body, and when we know that the communication is as direct with the heart, as that of head-waters with the ocean. For investigations show us, that no vein escapes, but in the deep-seated veins of the upper extremities, in the vena cava, splenic, spermatic, renal, and vesical veins, azygos, vena portæ, vena innominata, jugulars, sinuses of the brain, pulmonary veins, and in the veins returning blood from the large bones of the body, inflammation is found, and out of it arise those deep-seated abscesses of the liver, lungs, joints, cellular membrane, which occur so strangely and so uncontrollably after injuries of the head, parturition, amputation, and other great surgical operations. Although thus immediate in its effects, it differs in its degree and operation from the mild, adhesive character, causing merely an obliteration of the canal, to some extent, to the violent, suppurative kind, so diffuse and fatal.

As to its mode of operation in fatal cases, Lee says, "the researches of modern pathologists lead to the conclusion that, in the greater number of cases of phlebitis, death does not result from the

extension of the inflammation of the vein to the heart, the inflammation having been sometimes limited to a few inches only of the vessel. From the resemblance which the symptoms of phlebitis bear to those produced by injecting acrid and poisonous fluids into the veins of animals, and from pus being generally found in the veins of those who have died of phlebitis, the conclusion seems legitimate, that the constitutional symptoms of venous inflammation, generally, though not invariably, depend on the introduction of a fluid into the circulation, which contaminates the blood, and operates as a poison." This doctrine Cruveilhier adopts, and we find it to be his opinion, that unless pus enters the circulation, no matter how extensive the inflammation, those evil results do not follow, which are seen when the impediment formed by the coagula is removed, and we are borne down by atonic, adynamic fever, preceded by intense shivering, and followed by death. When we consider that the veins serve not only to return to the heart the blood which has served for arterial circulation, and has thus become unfit for the purposes of life, but that they constitute a great reservoir, in which all the phenomena of nutrition, secretion and inflammation are carried on, and in which are deposited, with the products of absorption, all the morbid causes which penetrate, or are generated in the economy, we can easily see how a deposition of pus, borne along these channels to every part of the body, should produce the constitutional and local effects witnessed so frequently on all sides.

The inflammation from wounds and venesection is found to extend in both directions, upward towards the heart, and downward towards the extremity of the limb, "contrary to the current of blood circulating in the vessel." And we find, that "not only are the coats of the vein inflamed in some cases of phlebitis, but the cellular membrane, skin, and other contiguous parts, participate in the disease, and suffer from the actual consequences of the inflammation."

Having shown the immense importance of phlebitis to the surgeon and physician, and having seen how it opens upon us in all inflammations—which are indeed resolvable into phlebitis, either venous or capillary—I shall consider,

1. The constitutional and local symptoms of phlebitis.
2. The causes of phlebitis.
3. The kinds of phlebitis, dependent upon the difference of situation.
4. The course, termination, and effects of phlebitis.

1. The symptoms of the disease, wherever it may be found, and under whatever circumstances, whether traumatic or spontaneous, have in all cases a distinct course, from which they swerve very little, and which impress us with the prostrating power of the inflammation. According to Cruveilhier, "the general symptoms are all those which are attributed generally to *purulent absorption*; to wit, extremely grave typhoidal symptoms, to which the diseased succumb with a greater or less degree of rapidity." Arnott gives a case as early as 1806, in which the following train of symptoms is found; the patient had been bled several times, from the 1st to the 15th of November, for epilepsy. On the 16th was bled from the right arm, which became swollen and very painful from the shoulder to below the elbow (having been preceded by some redness and tension about the aperture); face and skin of the body of a yellowish color, pulse feeble and frequent; 19th and 20th, fever more intense, tongue dry and coated, great pain in the arm; 21st and 22d, lies supine, great prostration of strength, heat of skin, tongue dry, pain in the right side of the chest, respiration short; 23d, tension of the arm diminished, some pus flowed from the wound made in bleeding; respiration short. Died at night, seven days after the receipt of the wound in the arm."

Mr. Hodgson speaks of a fatal case, accompanied with great constitutional irritation, and symptoms resembling typhus; and having found the degree of "constitutional irritation which takes place in extensive inflammation of the veins, to be attended with symptoms of greater debility than acute inflammation in general," he accounts for it, by supposing the effect to arise "from the great extent of inflamed surface," and also, as it would seem, more probably, by inferring that "the effect is produced upon the nervous system by the pus, which is secreted into the vessel, being mixed with the blood." In this latter supposition, he approaches nearly the ideas of Cruveilhier, thereby differing from Travers, who sneers at the noxious qualities of pus, contending that the most rapidly destructive inflammation is that which has the true adhesive process, in which no pus is secreted. He attributes the injury to the diffused, disorganizing character of the inflammation, acting upon the great extent of surface occupied by the lining membrane of the veins. Having inquired into the essential points of distinction between veins and arteries, as far as regards their texture and properties, and considered the relative pathology of these vessels, he observes, that "the

contrasted character of inflammation of arteries and veins abovementioned, explains the active constitutional sympathy peculiar to the latter. This corresponds with our observations of the difference, in this respect, presented by the bounded and undefined inflammations of the joints, the peritoneal or pleural cavities, and other shut sacs of the body." With him, the character of inflammation of the veins is continuous, and the constitutional symptoms correspond to this. The violence of these symptoms appears to him sufficiently explained, not by absorption of pus, nor by the transmission of the inflammation to the heart, nor by the great degree of sympathy existing between the venous system and the constitution, but by the fact, that veins being indisposed to inflammation, except by continuity, have the more effect upon the constitution when they are thus excited. This kind of inflammation he finds also in the absorbents, and the effects upon the constitution to be the same. Now do we not find in this very parallel which he has drawn, a refutation of his theory? Do we not trace to the reception of a morbid poison, the inflammation of the absorbents, and may we not find in pus, also, as a morbid poison, a cause for inflammation of the veins? Each takes its irritating matter into itself, and becomes inflamed in consequence, with corresponding constitutional symptoms.

Recent pathological researches show us a strong resemblance between the symptoms of phlebitis, and those produced by injecting acrid and poisonous fluids into the veins; from which we may safely infer, that pus, as it is generally found in the veins, in fatal cases of their inflammation, acts as a poison, and contaminates the blood. Hence, "alteration du sang," and "infection du sang," of Cruveilhier.

In many cases of crural phlebitis, given by Lee in his treatise, we shall find the trains of symptoms so clearly marked out, that in no way can a better idea be got of the course of the disease than by quoting them. He has found it occurring in puerperal women, as it were, traumatic, and in women who are not in a puerperal state, and men, with whom the attacks were spontaneous. Traumatic or spontaneous, the symptoms are the same.

"A woman, aged forty, who had been delivered of twins a month before, and who had nearly perished from flooding, and subsequently from an attack of uterine inflammation, was seized, on the 27th August, 1829, with a violent fit of cold shivering, followed by pyrexia and pain in the right iliac region and groin. In the course of two

following days, the pain increased in severity, and extended down the inner surface of the thigh towards the ham, and the whole leg and thigh became much swollen. 29th. The whole right inferior extremity affected with a general intumescence, and completely deprived of all power of motion. The temperature of the limb, particularly along the inner surface, much higher than that of the other, but the integuments retain their natural color, and do not pit on pressure. The femoral vein, for several inches under Poupart's ligament, is very distinctly felt enlarged, and is very painful when pressed. Out of the course of the crural veins little uneasiness is produced by pressure. In the right side of the hypogastrium there is also great tenderness; pulse, 120; tongue furred. She appears pale and depressed, and complains of deep-seated, acute pain in the lower part of the back when she attempts to move. From this period until the 22d of September, when she died, she suffered from repeated fits of shivering, which occasionally assumed a regular intermittent form; there was diarrhœa, with brown tongue; the glands in the right groin became enlarged, and the left inferior extremity became affected in a manner similar to the right."

As we are now concerned with symptoms alone, I shall place the appearances found after death, among the terminations, effects and course of phlebitis.

In most cases of crural phlebitis, in puerperal women, there is an attack of uterine inflammation, in the interval between delivery and the commencement of the swelling in the lower extremity; or there are certain symptoms present "which are to be regarded as ***characteristic of venous inflammation***, viz., rigors, headache, prostration of strength, a small rapid pulse, occasional paroxysms like those of ague, nausea, loaded tongue, and thirst." The local symptoms are most easily found in these cases, on account of the size of the veins inflamed, and superficial manner in which they lie. We are, therefore, indebted to them for the clearest view of these symptoms. And since in all cases there is a resemblance, so that Dr. Cheyne observes, in his report of the Whitworth hospital, which contains an account of dysentery, that "it is worthy of remark, that a swelling occurred in several patients, both males and females, resembling phlegmasia dolens, in all respects but in its connection with parturition," I will give the course of local symptoms Lee has afforded us in his account of the crural phlebitis of puerperal women.

He says, "the sense of pain, at first experienced in the uterine

region, has afterwards been chiefly felt along the brim of the pelvis, in the direction of the iliac veins, and has been succeeded by swelling and tension of the part. After an interval of one or more days, the painful tumefaction of the iliac and inguinal regions has extended along the course of the crural vessels, under Poupart's ligament, to the upper part of the thigh, and has descended from thence in the direction of the great blood-vessels of the ham." Pressure aggravates the pain; and we can trace the femoral vein, like a cord, rolling under the fingers. The whole limb gradually enlarges; the integuments tense, elastic, hot, and shining, and there is pitting on pressure, or not, according to the acuteness of the attack, and the length of time it has continued. At times there is diffuse erythematous redness. Power of moving the limb is usually lost, and the greatest freedom from pain is felt in a horizontal posture with the leg slightly flexed."

A case of crural phlebitis in a man, will show the analogy between the disease as met with under different circumstances, puerperal or not.

Case recorded by Drs. Graves and Stokes. "A young man of strong habit was employed for two successive days in working in a ditch, and was consequently obliged to stand in water above his knees during that time. On the following day, he became affected with lassitude, vertigo, and general weakness, and complained of severe pain in the right thigh. These symptoms continued for several days, when he was admitted to Meath Hospital. His countenance was anxious and depressed, the tongue furred, thirst, headache, urine scanty, turbid and high colored; pulse ninety-six, skin mottled with petechiæ. In addition to these general symptoms, the respiration was labored and unequal, with some cough; face very livid. But his chief complaint was a severe pain in the upper and anterior part of the right thigh, which was greatly aggravated by motion or pressure. He had also severe pain in the left hypochondrium.

At this time no swelling of the limb whatever could be detected; but in the course of two days the upper portion of the thigh became evidently swollen, the part being extremely tender, but not at all red. The pain of the side continued, and extensive bronchial and pneumonic inflammation was detected. General bleeding, and very free leeching to the limb was employed. The blood was not inflammatory, and no relief was experienced by the patient. The swelling of the thigh increased; calomel and opium were freely ex-

hibited, but without any effect. The typhoid symptoms increased, and the patient died on the fourth day after his admission.

We have thus seen the strong typhoidal type which the symptoms assume in phlebitis; for we have in typhus, according to Stokes, "listlessness and indisposition to exertion, alternate chills and hot flushes, with uneasiness and pain in the pit of the stomach. The symptoms are succeeded by pain in the back and loins, burning heat of the skin, flushing of the face, sense of weight in the head, or giddiness, noise in the ears, and disposition to quietude. The expression of the countenance indicates intellectual dulness. Pulse is frequent and soft," or "struggling and variable; anxious breathing; rough, foul and dry brown tongue; bowels torpid in the beginning, becoming in the advanced stage exceedingly loose; petechiæ appear," according to the severity and stage of the disease. Here we have a number of symptoms, strikingly parallel with those already enumerated, as belonging to phlebitis. Now we know typhus fever has its origin in malaria, which exert a poisonous influence upon the fluids of the body. The petechiæ, and tendency to gangrenous sloughing, with other low general symptoms, are strong evidences of this, and may we not, thus finding an analogy between the two diseases, look to similar causes whence may arise the resemblance? May we not judge from the *symptoms*, then, general and local, that in both cases the blood is poisoned; in fever, by reception from without of miasmata; in phlebitis, by generation of poison within the vessels themselves? Do we not find proof in the symptoms, therefore, that the introduction of pus into the circulation constitutes a prominent point in the course and fatality of the disease, instead of "diffuse inflammation," and the sympathy of the constitution with the peculiar kind of inflammation the veins take on, as Hodgson and Travers would have us believe?

2. *Causes of Phlebitis.*—Any irritating cause acting upon the coats of the veins, as wounds or external violence, may produce phlebitis. In amputation, in phlebotomy, in separation of the placenta from the uterus, in wounds of the head, and in comminuted fractures, we find powerful causes. Cruveilhier says operations on the bones are exceedingly apt to produce it, and he refers the constant symptoms to a miasmatic infection of the whole mass of fluids. The application of a ligature to the vein, and its division for the cure of varix in the lower extremities, cold long applied to a part, chilblains and gangrene, may produce inflammation of these vessels. We have

laid down as a general law by Cruveilhier, that we should "never touch a wound when it is yet under the influence of violent inflammation. Independently of the excessive pain produced thereby, we are liable to transfer to the suppurative those adhesive inflammations, which hold their place, and evidently the veins participate in this transformation, as well as the other tissues."

Many cases are given, in which ligatures about different veins have caused fatal phlebitis; Mr. Hodgson reports cases; Mr. Oldknow, in the Edinburgh Medical and Surgical Journal, gives one where this operation on the saphena vein was fatal; and Mr. Travers, where the femoral vein was affected.

Mr. Hodgson gives a case coming under the observation of Mr. Freer, in which the ligature of a varicose vein was followed by violent pain in the left side of the chest, labored breathing, and a violent vomiting of blood for hours after the operation. On removing the ligature, the symptoms subsided, and in the course of time the vein appeared to be impervious below the part which had been tied, and several varices on the calf of the leg were harder than before the operation. About six weeks after the operation, a large vein, a little above the outer ankle, was tied with a single ligature which was immediately removed; the patient became feverish soon after and vomited twice. During the following day her pulse was natural; on the third day after the operation, the vessel to which the ligature had been applied was found to be impervious; but as other veins in the limb were varicose, and caused great pain and inconvenience, two of the largest of them were tied in a similar manner. The operations were performed nine weeks after the last, which has been described. The ligatures were cut away immediately after their application. In three hours the patient vomited a fluid slightly tinged with blood. On the second day, her pulse was almost imperceptible, and she was attacked with delirium and severe vomiting. On the third day the symptoms had increased; the pulse was scarcely to be felt on the fourth day. On the sixth she was delirious and depressed; after a bleeding from the arm the pulse became fuller, and she began gradually to recover; the incision healed, and obliteration of the vein was produced by a ligature, which was immediately removed.

Lee gives a case, reported to himself by Sir Astley Cooper, "in which he met with a tumor on the saphena major vein. The tumor was laid open or removed, and inflammation of the vein succeeded,

which destroyed life." Sir Astley cut out a varicose enlargement of the venda saphena above the ankle, and a fungoid tumor below the knee, through which the saphena ran, in both which cases great inflammation ensued, high constitutional irritation and death.

In phlebotomy, we often meet with severe phlebitis ensuing in the punctured vein, without any apparent cause. Moving the arm soon after bleeding, a bad state of the lancet as to sharpness, and the instrument being charged with putrid or irritating matter, have been assigned as reasons by Abernethy, Dr. J. Thomson and M. Breschet; but a peculiar irritability of the constitution, and a certain state of atmosphere, inasmuch as phlebitis frequently occurs at particular seasons, have probably a more powerful influence than any other causes, in the production of traumatic and other varieties of phlebitis." M. Dance has published a case of a young physician who died from phlebitis caused by having punctured a small phlegmon with a bistoury, which he had employed in opening an anthrax a month before. Mr. Howship gives in his collection, a specimen of inflamed varicose saphena vein. It is tortuous, and connected with it are several pouches filled with coagulum of blood. The inflammation arose from a gouty state of the foot transferred to the saphena vein, and extended a considerable way up the limb.

The pressure of tumors and other bodies may cause inflammation of the veins,—a fact which enabled Mr. Travers to obliterate a varicose saphena behind the inner condyle of the knee, by means of adhesive straps applied around the limb, with as much firmness as could be borne.

Varicose veins are cured by spontaneous inflammation, in which cases Mr. Hodgson found strings of coagulum deposited, and a subsequent firmness of the vein, rendering it incapable of being emptied even by pressure. Hodgson has seen "four cases, in which this event terminated in spontaneous cure of varices. In these instances it is probable that the coagulum accumulated until it completely filled the varix, or the upper portion of the vein communicating with it; the blood, being unable to pass forward, coagulated in the vessel to a considerable extent. This coagulum was gradually absorbed; as its absorption advanced, the coats of the vein contracted; the vessel was ultimately obliterated, and the blood was conveyed through collateral channels."

This spontaneous inflammation is not confined to the veins of the extremities, but occurs also in those of the great viscera. Cruveilhier

gives a case in which the cellular sheath of all the branches of the vena portæ was inflamed, the vein itself being sound. Broussais thinks the veins are often inflamed in smallpox, measles, and scarlatina. Ribes refers erysipelas to the extremities of the veins; and Bouillaud finds in phlebitis, the point to which the phenomena of typhus fever are referable. We have a case reported by Lee, in which the extraction of a tooth caused a fatal inflammation of the dental and maxillary veins, extending so far that pus was found in the veins of the brain.

We have for crural phlebitis of women, a fertile cause in the uterus and the several acts it performs. Dr. Davis, in an essay read before the Medical and Chirurgical Society, having proved that phlegmasia dolens is an inflammation of the iliac and femoral veins, has been subjected to the attacks of Mr. Lawrence and others, as to the cause. He refers it to pressure of the gravid uterus, and at no time, until Mr. Guthrie wrote in the Medical and Physical Journal, in 1826, had it been suggested, that perhaps by tracing the inflammation from the common iliac, down to the uterus on the affected side, the origin of the disease might be found to exist in that organ. Even Velpeau has given it as his opinion, that the disease, instead of originating in the veins, arises from inflammation and suppuration of the articulations of the pelvis, and is thence transferred. Lee, in a work on the "Pathology and Treatment of Diseases of Women," offers, as the result of long and thorough investigation, the belief that "if inflammation be excited in the uterine branches of the hypogastric veins, it may continue to spread along these until it reaches the common external iliac and femoral veins, and by the morbid changes induced in them, give rise to all the subsequent symptoms." In the reports of his dissections, we find the branches of the internal iliac called the uterine plexus, highly inflamed, completely plugged up with coagula, and thickened and contracted. He says, "Inflammation of the vein rarely takes place in any part of the body where it cannot be referred to a wound, or some specific cause acting externally on the coats of the vessels. In uterine phlebitis, the inflammation cannot, it is true, be traced in all cases to the semilunar shaped orifices in the lining membrane of the uterus, which communicate with the sinuses, where the placenta has adhered; yet it scarcely admits of a doubt, that the frequent occurrence of the disease arises from the orifices of these veins, in the lining membrane of uterus, being left open after the separation of the placenta, by which a direct communication is estab-

lished between the cavities of the veins and the atmospheric air, in a manner somewhat analogous to what takes place in amputation, and other extensive wounds."

That this theory is worthy of adoption, even were it not supported by the numerous cases brought forward by its author, must be seen when we inquire at what time the inflammation commences in puerperal woman. All who have treated of the disease, "describe it as commencing, in the great majority of cases, subsequent to the tenth day after parturition, with symptoms of uterine irritation, and constitutional disturbance of a low typhoid character, and with pain and swelling in one extremity only." In women who are not in a puerperal state, we find the disease arising also from whatever cause disturbs the uterine functions, such as suppressed menstruation, and malignant ulceration of the os and cervix uteri. We have nothing here like inflammation and suppuration of the articulations of the pelvis, which Velpeau would have us to believe to be the cause of the disease, by an absorption of pus. In crural phlebitis, in men also, what do we find to be the causes? External injuries, exposure to cold and moisture, and ulcers, amputation, and tumors pressing upon the vena cava and iliac veins. In all cases, something acting upon the coats of the large veins; whence we should infer that the affections of the pelvic articulations were caused by the inflammatory action of the veins, when the two lesions exist together, rather than a reversed order of things.

We have very many other causes of what is called phlegmasia dolens in men, besides those already mentioned. Lee has a specimen of inflamed external iliac and femoral veins obtained for him by Dr. Forbes, who received it from Dr. Macann, where the disease was subsequent to dysentery, and by its supervention on this disease caused death. Drs. Graves and Stokes have seen it occurring after fever; and in this disease, as well as in dysentery, Dr. Lee thinks the hemorrhoidal veins are the first affected.

Cruveilhier records a case in which a sound was introduced into the bladder for retention of urine, caused by an enlarged prostate. Pain soon came on in one of the lower extremities, and the veins became painful and distended like hard cords. After death, all the various degrees of inflammation were discovered in the veins of the limb. Cruveilhier judges that, without doubt, inflammation of the prostatic and vesical veins had been induced by the introduction of the instrument.

A slight blow on the shin, over a branch of the saphena, has been followed by swelling and inflammation all over the whole limb, and pain in the direction of the upper third of the saphena, before it dips to unite with the femoral vein. After a long time, the symptoms having subsided, the saphena and femoral veins had evidently become impervious from the inflammation.

In assigning all these causes, it must be seen how completely they lie bare upon the surface, giving us no view, even the most indistinct, into the depth of the truth. We see that from phlebotomy, amputations, uterine diseases, visceral lesions, ligatures, blows, and even the slightest accidents, and unusual exposure, the disease may arise; and we have foul lancets, and little extraordinary motions referred to, as sober causes of a grave complaint. But how many thousands are bled with bad instruments, how often have we seen a rusty phlegm driven into the great plexus of veins in the breast of a horse (for Mr. Hunter has seen phlebitis in them from this cause), how many amputations, deliveries, and kicks upon the shins do we meet with, how often have we stood day after day knee-deep in mud and water, without knowing a symptom of phlebitis! Underneath all these superficial causes must lie the great cause, which must be to us contained in that general *corps du reserve*—constitutional predisposition. As by long labors in the dissecting room, we bring our bodies to such a state, that wounds which otherwise would have been received with impunity become exceedingly dangerous, so may, one would think, the slightest accident, coming at the proper time, give rise to phlebitis,—an accident which, under other circumstances, would scarcely have been recognized by the system.

3. *The kinds of Phlebitis, dependent upon difference of situation.*—This division must necessarily be extensive, inasmuch as every part of the body is subject to inflammations, which may be called phlebitis. By a too refined delicacy, every vein might have its peculiar phlebitis, or at any rate its individuality in the disease, as far as a name is concerned. For inflammation itself is capillary phlebitis; as Cruveilhier says, "in all inflammations, the venous radicles are specially affected." But I have founded distinctions on this ground, as the most convenient form of presenting the most important modes in which the disease appears,—having first drawn the general division into traumatic and spontaneous, before referred to. The terminations, &c. of each come in another division.

Uterine phlebitis is one of the most formidable forms of ***puerperal fever*** (Cruveilhier); a woman, who has just been delivered, being properly compared to a person who has met with a severe accident, or undergone a surgical operation. Its symptoms and causes have already been regarded.

Phlebitis of the sinuses of the dura mater may be primitive, and in a manner spontaneous, or consecutive to the introduction of an irritating body into the circulation. It has been treated of by Ribes and Hooper, and still more recently by Cruveilhier. According to the latter writer, it presents the anatomical characters of phlebitis of other parts of the body; in the first period, coagulation of the blood; in the second, suppuration in the centre of the clot; in the third, pus filling the sinus. We have, of course, complete apoplectic symptoms—and find œdema as in other parts of the body when the veins are obstructed, and foci of blood, true apoplectic centres (foyers), occur in the substance of the brain and cellular tissue. We find different pathological conditions depending on the difference of attack, the extent of the lesion, and still oftener on the rapidity of the obliteration of the sinus.

"If inflammation of the sinuses of the dura mater leaves little to desire, in the point of view of pathological anatomy (which will be referred to in Termination, &c. of Phlebitis), it is not so in a diagnostic and therapeutic point of view. The analysis of symptoms observed in the different individuals, who have presented phlebitis of the sinuses, conducts to nothing positive. Somnolence, profound coma of some, convulsive movements of others, the air of stupor, the excessive headache in some cases, betray without doubt a suffering of the head; but is this suffering idiopathic? is it sympathetic or symptomatic? New facts will perhaps allow us to discover, in the midst of this crowd of cerebral phenomena, causes, without which the solution of this problem is impossible. Until then, therapeutics will be reduced to the general means of relieving cerebral congestion." (Cruveilhier.)

Phlebitis of the pulmonary artery occurs in the form of lobular pneumonia, and seems rather to be the result of phlebitis in some other organ, than spontaneous and idiopathic. Cruveilhier has related a case, in which it arose from uterine and hypogastric phlebitis, and as in its whole course it seems to be a transfer and termination of this latter form of the disease, the whole account of it appears to come under the last division I have made of the whole subject.

Phlebitis of the upper and lower limbs is found either with œdema, when the veins are very much obstructed, or without œdema, when either the superficial or deep-seated veins are free from inflammation, leaving, through one or the other, a passage for the blood. When occurring with œdema, it is called ***phlegmasia dolens***, the causes of which have already been enumerated. It may be well to remark here, that, as cancer of the uterus often produces phlebitis with œdema in the lower limbs, so cancer of the mammæ, acting not upon the blood-vessels, but upon the lymphatics, causing their obliteration, either in their course or in the substance of the ganglia through which they pass, and are distributed, produces œdema of the upper limbs.

Phlebitis of the Venæ Cavæ, superior and inferior.—Inflammation of the latter arises most frequently from a similar affection in some of the veins going into it; often the disease goes on to the obliteration of the vein. Inflammation of the former is a much more rare occurrence, although attended, when it does happen, with the same phenomena.

Hepatic phlebitis, of a capillary nature, after operations, is well known. In cancer of the liver and stomach, it may happen; and Cruveilhier has seen it occurring in animals, with obliteration of all the hepatic veins in consequence of a division of the two pneumogastric nerves. As the result of traumatic phlebitis, it is exceedingly important and frequent, as will be seen hereafter.

Trumatic ***renal phlebitis*** is rare.

Splenic phlebitis has occurred so seldom that Cruveilhier has never seen inflammation of the splenic vein itself, nor that traumatic capillary phlebitis, the course of which he has so distinctly traced in other organs.

We have also, testicular and hemorrhoidal phlebitis, and phlebitis of the bones, each arising from an irritating cause in operations on the parts, but chiefly interesting for their results.

Capillary phlebitis constitutes, according to Cruveilhier, the whole phenomena of inflammation; and the capillary venous system is the seat of inflammation—a position established by him in the following manner. (Dic. de Med. et de Chir. Pratique.) To M. Ribes is due the honor of having fixed the truth of venous capillary inflammation in erysipelas, puerperal peritonitis, and adynamic fever; but by a series of experiments and observations, Cruveilhier, while others

overlooked all hints from M. Ribes, proved, to his own satisfaction, the two following propositions, which he considers conclusive, and comprehending the whole matter; 1st, that in all inflammation, the venous capillaries are specially affected; 2ndly, that inflammation of these capillaries gives rise constantly to all the phenomena of inflammation.

The first of these propositions is proved by examining inflamed tissues, such as the conjunctiva, the mucous membrane of the pharynx, the gastro-intestinal mucous membrane, with a magnifying glass, and we shall see that the inflammatory redness has its seat in the veins. In serous membranes, too, we shall find venous areolæ, rectilinear and curved veins arranged in little pencils, stars and network, as it were varicose, forming here and there islets, from which a great number of vessels go out in every direction; and if one has patience to follow these vessels, which is easily done on membranes, he will see clearly that they are continued by veins of less calibre. The considerable developement of veins in the diseased part, the œdema which attends the inflammation, in a word, every thing goes to announce that the veins are subjected to the capillary injection; now capillary injection is considered a sign of inflammation, and wherever inflammation exists, whether in the periosteum, bone, cellular tissue, lungs or liver, there we find the little veins dilated.

In false membrane, which is organized, we seek in vain for anything besides venous vessels; and it is the same, whether the deposit be recent or of long standing. It is even probable that venous blood supports accidental tissues, as in other circumstances it suffices for the life of inferior animals. In the series of beings the venous system is first developed, and first arrives at perfection.

2. Inflammation of venous capillaries, constantly gives rise to all the phenomena of inflammation. By experiments it is proved, that the injection of an irritating fluid into the arteries causes complete gangrene of the limb, which is more perfect and rapid when the blood is wholly obstructed. This obstruction may take place by the deposit of coagulum in inflammation, and the gangrenous result be as perfect. But is this one of the common phenomena of inflammation?

The injection of irritating matters into the veins, has for its results, 1st, œdema of the limbs; 2d, apoplectic centres in the substance of the members or in the cellular tissue; 3d, purulent centres around the suppurated veins. The veins serve not only to bear back the

blood from the circulation to the heart, but they appear to constitute a great reservoir in which all the phenomena of secretion are carried on, and in which secretions, morbid as well as natural, are made; and all the morbid causes which are engendered in the economy or penetrate into it, appear to find their seat in these organs. It is through their mediation that primitively local diseases become general. The arteries are merely passive conduits which convey the blood from the left side of the heart.

After this, one must see the utility of venesection in inflammation and fevers, and the little use of arteriotomy; in erysipelas the latter has proved useless, although the quantity of blood lost has been in some cases excessive. The inflammation subsided in no degree whatever. The arterial hemorrhages, which often supervene upon inflamed cancers, far from diminishing the inflammation, seem usually to excite the erosion to a greater activity. Arteriotomy, then, since it has never an effect, which cannot be equalled by venous bloodletting with as much success, ought to be placed far below the latter, if it ought not to be wholly proscribed.

3. *The course, termination, and effects of Phlebitis.*—We have coagulation of the blood, and consequent obstruction of the veins, adhesions of the sides of the vessels, and suppuration in the course of this disease. Coagulation occurs in traumatic and spontaneous phlebitis equally, and we find it producing œdema of the limbs, by a stoppage of the blood, and a serous effusion in the part; this is true phlegmasia dolens. With the œdema, we have a perceptibly hard and very painful cord, instead of the free vein, easily distinguishable from an inflamed lymphatic vessel, by the more superficial position of the latter, and its rose-color, and knotty appearance on the skin.

Adhesion from inflammation is also very common, and occurs as often as we have any solution of continuity. In accouchement, amputation, wounds, in every ligature of the umbilical cord, we have this stage of phlebitis. The coagulum is by degrees absorbed, and becomes sometimes filled with vessels and organized, at others entirely taken away; impermeability being the result in either case. All this may happen without any great derangement, unless the extent of lesion be great, or the situation mortal. In the sinuses of the dura mater, for instance, the disease has no time to reach the adhesive state, the mere obstruction of the circulation proving fatal;

in other cases, however, we have at this period our chance of cure, and here we have a good one even in uterine phlebitis.

The coagulum is not homogeneous, being the most dense where it adheres to the walls of the veins; its absorption commences equally in all points, but in its organization the external portion presents the most advanced changes. It often, in the great veins, resembles the contents of an aneurismal sac, presenting a pultaceous, grayish matter, which brings on local inflammation, and oftentimes a local abscess, which being opened, discharges its matter externally.

At times, in spite of our treatment, and as it were by some miasmatic or individual influence, the disease will run on to a suppurative state, with typhoidal symptoms, so marked that some authors have been disposed to refer this form of fever to a kind of phlebitis with absorption of pus. It may occur also from bad treatment, where inflamed parts are irritated, as in tents used to stop hemorrhage, or in trials to extract foreign bodies when the parts are already in an inflammatory state.

The pus is deposited not between the vein and the coagulum, but in the centre of the clot; not by any organization of its own, but by a sort of capillary attraction, as pus is filtered through the false membrane in pleurisy, from the inflamed vessels beneath, or the pleura itself. As the disease goes on, the coagulum is diminished, and the pus increased; different parts of the venous canal presenting the various kinds of inflammation, adhesion, and suppuration. And care must be taken to keep the distinction between the inflammation of the vein, and its surrounding cellular tissue, clear, inasmuch as they may occur together, though the latter seldom passes to suppuration.

In all this suppuration we have nothing but local symptoms, unless the pus is carried directly into the circulating current of blood. It may be absorbed as in common abscess, it may distend and diminish the vein, and it may constitute an abscess which an inattentive observer would confound with ordinary abscesses. But as soon as the coagula are broken through, and all obstacles removed, so that a mixture of blood and pus takes place, so soon typhoidal, adynamic, ataxic symptoms come on, preceded by chills and followed by death. The internal surface of the veins never presents the ordinary appearances of inflammation, that is, capillary injection, but rather a redness, as it were from tincture. This passes away as the suppurative stage comes on, until it entirely disappears, when the vessel is completely occupied by pus. This has led some authors to contend,

that pus is not secreted in the vein itself, but transported thither from some other part of the body; forgetting that the membranes, either in a healthy or morbid state, do not admit of injection. We recognize their inflammation, by the vascularity of the external membranes, by the cohesion and brittleness of the outer cellular tissue, where lymph is deposited, even when we have neither adhesion, nor pus in the vein to guide us.

We thus see what kind of inflammatory action the veins take on, and what course is pursued locally in different cases. When, however, the disease becomes more diffuse, and is attended with high constitutional symptoms, the examination leads to a far more extended field than merely the origin of the complaint. In the first case noticed among the "symptoms," Lee reports, on dissection, the following appearances. "The divisions of the vena cava were, in this instance, both affected. On the left side, the cavities of the iliac and femoral veins were filled with a dark purple coagulum, their coats being not much thicker than natural; whilst on the right side, the coats of these veins were dense and ligamentous, and the cavities blocked up by adventitious membranes, or lymph of a dull yellow color. The lower part of the vena cava, for the space of two inches, as well as the right common iliac, was obstructed by a tough membrane of lymph surrounding a soft semi-fluid yellowish matter. The right common external and internal iliac veins were imbedded in a mass of suppurating glands, the purulent fluid of which had escaped into the adjacent cellular membrane, and forced its way downwards in the course of the psoas muscle, as low as Poupart's ligament. The right hypogastric vein was reduced to a small impervious cord, and its branches were distended with coagula or lymph, of a bright red color. The right femoral and its branches were in like manner impervious, their coats being greatly thickened, and their interior occupied by coagula. The cavities of the left common external iliac and hypogastric veins, contained soft coagula, disposed in layers, which adhered to the inner tunic of the vessel. The trunk of the left hypogastric vein was contracted, its coats somewhat thickened, and its branches filled with worm-like coagula. The spermatic veins were healthy. The cellular membrane of both lower extremities was infiltrated with serum."

In the case reported by Drs. Graves and Stokes, of crural phlebitis, induced by exposure to cold and moisture, the appearances on dissection were: "The right lower extremity was found to be tense

and swollen in its superior portion, while the leg and foot were slightly anasarcous. The sac of the pericardium contained some sero-purulent fluid; and that portion covering the auricles and great vessels was vascular, and in many cases covered with coagulable lymph. Both lungs were in a state of extreme sanguineous congestion, with commencing solidity in their posterior inferior portion, and general inflammation of the pleura. The bronchial mucous membrane was universally red, and the tubes filled with frothy mucus.

The vena cava contained a few portions of a substance of a granular appearance, friable and of a yellowish color. This did not adhere to the vessel, which otherwise appeared healthy. In the external iliac vein, however, just above Poupart's ligament, there was a large concretion, of a similar nature, nearly plugging up the vessel, and extending into some of the minute collateral branches. The lining membrane was red, and in one point adhered to the coagulum. No puriform matter could be detected. The femoral and popliteal arteries were healthy. The cellular tissue of the limb was œdematous. The condition of the saphena vein, where it enters the femoral, is not described, although the inflammation most probably originated in the "superficial vessel."

In uterine phlebitis there is an astonishing influence exercised over other parts of the body. The brain, both in its substance and membranes, the lungs and pleura to a very great extent, the mucous membrane lining the stomach, the spleen, the conjunctiva of the eyes, the nose, have all been affected to a greater or less degree. Deposits of pus have been formed in the cellular membrane, between the muscles of the extremities, "and often in the neighborhood of the joints; the cartilages of the joints themselves become ulcerated, and pus is formed within the capsular ligaments."

In phlebitis of the sinuses of the dura mater, Cruveilhier has not observed, as consequences, the same general phenomena and visceral suppurations which he has so often met with in phlebitis in other parts of the body. But inflammation of the sinuses being accompanied by that of the surrounding veins, we find, as we do in inflammation of the veins of a limb, centres of blood, true apoplectic centres in the substance and cellular tissue. Hence we find in inflammation of the sinuses with the collateral branches, sometimes an exhalation of serosity, sometimes an effusion of blood into the cavity of the arachnoid, at times large ecchymoses, softening of the gray and white substance of the convolutions, capillary apoplexy, and apoplectic centres.

Phlebitis occurs in the pulmonary *artery*, since it resembles a vein in its blood and internal membrane. A case is given by Cruveilhier of a puerperal woman, who having resisted uterine and hypogastric phlebitis, was attacked with inflammation of the pulmonary artery, which terminated fatally. Hard concretions filled its divisions, the clots being adherent in these parts, although they adhered strongly to the coats of the principal trunk, each clot having in its centre a collection of pus. Out of this arose capillary inflammation of the lungs, or pure lobular pneumonia, causing a rapidly fatal termination of the disease.

Phlebitis of the upper and lower limbs, generally, has as a termination an œdematous state of the part, depending on obstruction of the veins, although we have facts very contradictory coming under the pale of serous infiltration from this cause. The vena cava inferior itself has been obliterated without œdema. And, the interception of venous circulation demanding not only the obliteration of veins of a large calibre, but also that of the small veins, mark the facility with which a collateral venous circulation is established. In a case of very painful and severe œdema, which ends in death, the inflamed small veins are so slender that they might at first be taken for inflamed lymphatics.

In phlebitis of the venæ cavæ, we have obliteration and its consequences. In the inferior vena cava, the interruption of the blood in the lower half of the body does not necessarily follow, even when the obliteration extends below the opening, direct or indirect, of the great azygos into the inferior vena cava; the (*rachidien*) venous system constituting a collateral communication between the two venæ cavæ, which appears to suffice, for the most part, to re-establish the circulation.

Hepatic phlebitis terminates in abscesses in the organ, to a greater or less extent, in some cases surrounding the vena porta. When it arises from cancer of the stomach, as it undoubtedly does, we find the inflammation extending to every part of the organ; and when it occurs with ascites, the trunk of the vena porta has been found obliterated by adherent clots.

Renal phlebitis presents bloody clots, with purulent centres, in various situations. The renal vein has shown the effects of phlebitis.

In splenic phlebitis, which is usually traumatic and capillary, we have red induration, or an apoplectic centre, with formation of pus; inflammation of the splenic vein being very rare.

Phlebitis of the testicle, occurring chiefly after operations for varicocele, may terminate in suppuration of the veins and death, instead of that healthy adhesive inflammation which is the object of the operation.

Hemorrhoidal phlebitis (hemorrhoids being often on varicose veins or an erectile tissue), when it does not end in adhesion, goes on to suppuration, and the pus is borne to the liver, where it acts like foreign bodies in the circulation, and produces abscesses in that organ. Cruveilhier has seen this arise in consequence of immoderate attempts to reduce an old prolapsus of the rectum, and in consequence of an operation for fistula in ano.

Phlebitis of the bones gives rise, more frequently than any other, to abscesses of the liver and other organs; for we know from experiment how rapidly liquids are introduced, through them, into the general capillary circulation of the lungs and liver, and there produce abscess.

We have seen that a most common termination of phlebitis, traumatic or idiopathic, is in abscess of the lungs, liver, and other organs in the body. The cause of this ***metastatic abscess***, which has been seen in all ages to occur so frequently after great surgical operations, destroying patients when to all appearance the wound was doing well, has given rise to much contention, and many ingenious experiments. Without going through the doctrine of the ***development of pre-existing tubercles***, whose insufficiency is evident enough, when applied to acute and chronic diseases of the limbs, we find M. Blandin (La Lancette Francais, Gazette des Hopitaux, p. 73, Encyc. xxviii.) attributing these lesions to an altered state of the blood, causing a change in the walls of the vessels. He finds the blood changed to a deeper black than natural, resembling prune juice, and not easily coagulable. This modification we meet with in certain grave fevers, and it truly causes the ecchymoses found in these cases. The same thing happens here, but upon the viscera, and we meet with visceral inflammation of lobules, circumscribed inflammation, which certainly recognize for their cause the presence of blood, which, having escaped from its vessels, becomes easily a cause of inflammation, like a foreign body. It is very easy to explain why it is on the surface of these organs that effusions, or rather these infiltrations causing abscess, show themselves by preference; it is because the pressure upon the vessels is much less upon the surface of these organs, than in the centre.

He says many people consider phlebitis at the outset in the same light with himself, but they think pus is borne into the system. This opinion does not appear to him even probable; for, examine the organ, and you will see that you can follow the course of the abscess, step by step; so that in one point you will find a slightly black ecchymosis; farther on an ecchymosis more extended, deeper black, the tissue of the organ already altered in its consistency, and become more friable; and still farther a spot blackish at the circumference, gray at the centre, and you will gradually thus arrive at the true purulent collection.

The lungs are most often affected, and especially the right lung, because it is the most developed and has a greater tendency to hemorrhage; it is particularly at the base that these abscesses form, contrary to that which happens in tuberculous abscess. Next to the lungs, come in order the spleen, the liver, the brain, the sub-cutaneous and sub-aponeurotic cellular tissue; finally, the kidneys and the muscles.

From this theory, we come to that of Cruveilhier, which he has established by many curious and ingenious experiments.

The idea which presents itself, is the pure and simple transportation of pus from the wound into the viscera, or metastasis. This doctrine of purulent metastasis rests upon the following reasons; 1, upon the diminution, or even upon the suppression of the exterior suppuration which is a constant prelude to the formation of interior abscess; 2, upon the absolute identity of pus of the wound, and that of the abscess; 3, upon the absence of the general and local symptoms, which pathologists give as characteristic signs of visceral inflammation; 4, upon the rapidity of the formation of these abscesses; 5, upon the want of inflammation in the parts lying adjacent; 6, upon the presence of pus in the veins and in the right cavities of the heart, in the midst of clots of blood.

The absorption and transportation of the pus have been attributed at one time to the veins, at another to the lymphatics, as the discovery of the latter placed them uppermost in the minds of physiologists. Moderns have divided the absorption between both. This doctrine of absorption has been adopted by Velpeau, Maréchal, and Eugène Legalois, &c., and ably defended by them. Cruveilheir has, as well as they, seen pus in the veins and lymphatics, and found centres of pus in different organs, liver, lungs, &c., but he asks if this pus may not be formed in the same place, where it is met with,

being the result of a circumscribed inflammation in the organ. The decrease, or suppression of suppuration, may it not be the effect, rather than the cause of internal disorder, in virtue of this aphorism, "*Duobus doloribus (vel stimulis) simul abortis, vehementior obscurat alterum*"?

The following are his arguments in favor of the formation of pus in the place in which it appears; 1, the formation of visceral abscesses is always attended with general symptoms more or less grave, which find no explanation in the state of the wound; 2, the absence of local symptoms on the part of the viscera is no evidence of the absence of inflammation, for there exists a great number of phlegmasiæ without pain, and on the other hand it is not rare to see these *visceral* abscesses attended with a great degree of pain. But in general phlegmasia is as latent as possible; already Pigray has noticed that in consequence of wounds in the head, many wounded, in which the fever was declared the third day of the wound, and who had not manifested any pain, died with a great number of abscesses in the substance of the liver; 3, without doubt there exists a certain number of abscesses which do not present, without a purulent cyst, any trace of inflammation, inasmuch as, in this case, it would seem that pus has been deposited purely and simply in the net-work of the tissue of the organ; but this absence of inflammation one does not observe but in complete abscess, if I may so express myself; for if patients die at an advanced period of the disease, we meet with all degrees of inflammation circumscribed in the lungs or liver. As to the rapidity of the formation of pus, there is nothing which ought to astonish us, the duration of the malady being generally five or six days.

These abscesses being then idiopathic, that is, formed in the viscera by inflammatory action, we are called to the solution of this prolem, viz. "To determine how, in consequence of a wound which suppurates, numerous centres of inflammation supervene in the viscera."

Anatomy is vainly called upon to solve the difficulty; porosity, endosmosis, exosmosis, permeability, imbibition, continuity of nervous and vascular systems, corresponding sympathies, the law of consent, have all been forced to confess their want of power, and we are indebted to a series of experiments published by Cruveilhier, which appeared to him to have established this proposition:

"Every foreign body introduced into the venous system determines, when its elimination is impossible by the emunctories, to visce-

ral abscesses like those which succeed to wounds or surgical operations, and these abscesses are the result of a capillary phlebitis of these same viscera."

If we inject ink, for example, into the femoral vein of a dog, if the collateral veins do not carry the liquid into the circulation, in which case it is fatal, in a few hours the limb swells, and after death numerous bloody centres are found in the substance and cellular tissue of the limb. The large and small veins are distended with a concrete and adherent blood. If the animal lives, the bloody centres become purulent abscesses, and the clots in the veins are changed to pus. A wooden probe was introduced, from above downwards, into the femoral vein of a dog as far as the ham, and from below upwards as far as the ascending vena cava; the animal died with much oppression, becoming infiltrated in his lower extremities, and the infiltration extending as far as the thoracic parietes. All the veins of the lower limb were filled with pus, and when the muscles were divided, little centres of pus appeared here and there, which were veins filled with pus, which one could express easily. Around these veins the muscular tissue was red, friable, in a word, in a state of induration, which precedes suppuration. The healthy veins always correspond to healthy parts of the muscle, and diseased veins led constantly to a hardened centre. The femoral vein was transformed into a purulent canal, from which branches full of pus went out, instead of branches filled with healthy blood.

In these cases the phenomena were local, but had the animal lived long enough, it is probable that various abscesses would have been found in other parts, as after traumatic phlebitis. In order to determine what becomes of the pus, when it is borne into the torrent of circulation, since we cannot recognize it when mixed with the blood, we use mercurial injections into the veins, which can be recognized in their most minute parts. Wherever these injections are made, the mercury is eventually borne into the lungs, the animal dying in eighteen or twenty-four hours with symptoms of asthma or suffocative catarrh, the lungs engorged with serum. If the mercury be less, and the animal live longer, a red induration will be found round each globule; still longer, purulent centres; and longer yet, tuberculous matter; and if the animal live two or three months, you will find tubercles having each in its centre a globule of mercury.

The medulla of the femur being replaced by mercury also, we find the substance borne to the lungs and filling the ramifications of the

pulmonary artery. This is done not by absorption, but the blood, deposited in the long net-work, draws along with it the mercurial globules by a sort of attraction, which is the necessary consequence of the movement of inspiration and of the dilatation of the right auricle.

Mercury, injected into the veins of the intestines, being borne to the liver in the natural course of circulation, produced in every part of the organ red patches resembling in color lees of wine, in which were contained globules of mercury. In these experiments, the mercury does not always reach the capillaries, but, in one case, was found to have affected the right branch of the hepatic vena porta, which with its divisions was filled with viscid pus.

From these experiments it follows, that the lungs, for the foreign bodies introduced into the general circulation, and the liver for those introduced into the venous system of the abdominal viscera, are an inevitable termination, and at the same time a barrier which they cannot pass over, but in a certain number of cases. All morbid causes taken with the food passing to the intestinal canal, and arriving thence to the liver, are there retained, to be evacuated with bile more abundantly secreted, or are left to go off into the general venous circulation. Those morbid causes penetrating into the economy by other ways than the alimentary canal, and those which have passed the liver, arrive at the lungs, which arrest them often, which sometimes evacuate them by the exhalation so abundant of which the interior of this organ is the seat, and sometimes also leave them to pass to the pulmonary veins, and thence into the arterial torrent, which bears them to all the organs and places them in the general capillary system, and the hepatico-splenia communicate freely with each other, and the morbid causes pass easily from one into the other. Inflammations of the pleura, peritoneum, &c. &c. ought to take place, therefore, in certain infections of the blood. All the capillary systems, general, pulmonary, and placentary, according to curious experiments of Vizuscens, are permeable, even to mercury. We know, according to this, that morbid causes can circulate a great number of times through the capillary system, and be deposited successively in the capillary system of certain organs, and even in different points of that of the same organ.

Cruveilhier quoted from M. Dance (Archiv. Gen. de Med., Dec. 1828, Jan. and Feb. 1829), who gives a graphic description of the different steps the visceral inflammation passes through, and the va-

rious states in which it is found in the same subject. He (Dance) says, "Observation has not yet taught us, whether the abscesses which supervene upon phlebitis, in the other viscera besides the lungs and liver, form themselves in the same manner; but analogy leads us to think it ought to be so, for these abscesses appear to be of the same nature, and ought to follow especially the same course."

"If, nevertheless, one reflects, 1, that all these lesions supervene in the course of phlebitis; 2, that they arrive in a few days to infiltration, and the collection of pus; 3, that they present special characters, such as an ordinary plain inflammation never developes in the lungs; 4, that by the side of an altered tissue one commonly finds a healthy tissue; 5, that the same lesions can be observed in the same organs, in consequence of an internal as well as an external phlebitis; 6, that finally the grave symptoms, with which they are attended, offer the greatest resemblance to those which announce a miasmatic infection of the fluids, one will agree that if the transport and mixture of pus with the blood in the course of phlebitis are not materially shown (for direct inspection is often insufficient, and chemical analysis cannot yet be of great utility in this respect), this opinion offers at least the greatest *probabilities*." Experiments, made by Cruveilhier, have converted these probabilities into comparative certainties. These experiments solve a difficulty which clinical observation alone never could resolve; viz. how, in the hypothesis of phlebitis, is pus borne from the general venous system into the capillary system of the liver? Ought not this pus to be arrested in the capillary system of the lungs? It seems, then, that there ought not to be abscesses but in the lungs. Now, observation proves that abscesses of the liver are very common, in consequence of wounds and surgical operations; so common that they are the first of which observers have made mention, and yet the capillary system of the liver does not communicate directly, but with the vena porta and the hepatic veins.

Mercurial injections, by passing through all the capillary systems, that of the liver, lungs, and the general system, reduce this objection to its just value.

It is then shown, with all the rigor of physical experiments, that pus, in circulation with the blood, is arrested in the different departments of the capillary system; that especially it determines to *capillary phlebitis*, or to circumscribed inflammations, which run through, more or less rapidly, their periods, to the production of abscess; that

this pus, like the mercury, is arrested most often in the lungs, then in the liver and kidney; that it can, moreover, like the mercury, run successively through many parts of the system, and produce circumscribed inflammations in all parts of the body.

Here the questions arise, why pus, absorbed from vast collections, as in the pleura and peritoneum, does not produce visceral abscesses? Is traumatic phlebitis necessary for these abscesses? In what consists the difference in the two cases? As often as a liquid susceptible of nutrition is in contact with a surface in suppuration, and this liquid is secreted by the tissues, and is a foreign body in the economy, this liquid is absorbed. This we always see, so that there is not a case in which it does not occur, as far as we know, when inflammation terminates in suppuration. But there is a great difference between pus absorbed, and thus taken into the circulation, and pus which is introduced in nature, in all its parts into the veins. During absorption a body is acted upon in such a way, that its different elements appear to be successively acted upon. Pus, for instance, appears to be at first deprived of its more liquid parts; its solid part being absorbed more slowly, and often not until it has assumed a caseous appearance. But pus taken purely into the circulation, and mixed immediately with the blood, altered as to its crassamentum, embarrassed in its progress, is arrested in the capillaries, and determines simultaneously a multitude of centres of inflammation.

The following experiment, often repeated, proves this. A great quantity of mercurial ointment being rubbed upon a dog, caused death in 7 or 8 days, with gangrenous inflammation of the gums and mucous membrane of the mouth, and no tissue nor any liquid gave any trace of mercury, when submitted to analysis.

The three ways in which pus can enter the circulation are, 1, by direct injection into the veins or arteries; 2, by the attraction exercised by an open vein; 3, by phlebitis. 1. Direct injection of pus, as of any other foreign body, as we have seen, produces very severe symptoms, and abscesses. 2. A great attraction is exercised by the mouth of an open vein upon liquids into which it is plunged. This is caused by the in-drawing produced upon the vessel by inspiration, and the dilatation of the right auricle of the heart. If, for experiment's sake, we open a vein, and keeping it in this condition, introduce a liquid into the bottom of the wound, we can see the alternate decrease and increase of the fluid. This attraction is exercised upon

the air in some cases, when the orifice of a vein is kept open by some anatomical circumstance.

Venous attraction could take place only on the first day or few hours. The clot once formed, we have no longer an open way for the passage of substances through the channel. Phlebitis then alone remains, to which we can attribute all the accidents, which occur in consequence of solution of continuity of the veins.

It is then shown, that visceral abscess, and all inflammations following wounds and surgical operations, are ***capillary phlebitis,*** which arise from another phlebitis in some venous point, and present the same characters which the latter does, whatever may be its situation. It is not admitted that the pus secreted in an inflamed vein, and borne into an organ, conspires directly, by itself, to this generation of a state of suppuration. Pus once mingled with the blood is no longer pus, but an irritating body. The rapidity of the formation of visceral abscess, the perfect soundness of neighboring parts, do not appear to me peremptory objections to inflammation; for 48 hours suffice sometimes to produce pus in an inflamed vein; and on the other hand, the circumscribed state of the pus, and the multitude of centres, are explained wonderfully by the seat of inflammation in the capillaries.

But it may be said, if this theory is true, these abscesses should always be preceded by phlebitis, in some one of the points in the economy. Perhaps all the veins may be examined, not only those neighboring upon the wound, but in other parts of the body, without finding traces of phlebitis. To support this objection, wounds of the head have been cited, which are often attended by abscesses of the liver, without showing any other trace of inflammation of the veins. But, the experiment of introducing mercury into the medullary canal, shown above, and its results, prove that if the state of this canal or the spongy tissue of the bones was not examined, these observations are not of the slightest value. Dance offers as an explanation of this, that the deep veins are inflamed; not only those which spread themselves into the brain and its membranes, but also those which penetrate the bones of the cranium (the diploic veins). Pus formed in these veins should go to the liver, or lungs, as from all the capillary venous system; for the liver is not exclusively affected in wounds of the head; and if a great number of observers have unitedly made mention of abscess in the liver, it is that they are contented, in the greatest number of cases, with observation of this viscus alone, the

lesions of which have appeared to give them a sufficient account of the phenomena. Experience proves that the diploic veins are found purulent, in most cases of wounds of the head co-existent with abscesses of the liver and lungs. The visceral lesions have been found in the liver, lungs, kidneys, &c. Now, as inflammation of the veins of the bones, not only those of the diploe, but of all the bones, gives rise to visceral abscess, this general proposition may be established, viz. phlebitis of the bones is one of the most frequent causes of visceral abscess, in consequence of wounds and surgical operations, in which the bones have been concerned.

The spongy tissue of the bones has a circulatory system, and is constituted in such a way, that an anatomical observation will teach us how readily inflammation of these veins will lead to the same consequences as ordinary phlebitis. Perhaps even, suppuration of these areolæ has results more rapidly and necessarily grave, than inflammation of the free veins. In six hours, mercury injected into the interior of the medullary canal, arrives at the lungs, and it may reach these organs in even less time.

With this susceptibility on the part of the bones, great care is necessary in all operations upon them; and a law laid down by Cruveilhier, which I have mentioned before, may well be repeated here; that we should never touch a wound, when it is yet under the impression of violent inflammation; for no operations give place more infallibly to the formation of visceral abscesses, and consequently whose results are more sad, than those which are practised upon the bones, especially when one repeats the attack several times, with many days intervening. In all the inflammations accruing in consequence, the veins are ever ready to participate, with the terrible consequences we have already seen.

With regard to the *treatment* of phlebitis, which should claim attention, but little can be said with any degree of satisfaction. When it occurred from blood-letting, Hunter applied firm compresses above the wound, to produce obliteration of the canal of the vessel, by bringing its sides in contact; this does not, however, prove successful. We resort chiefly to antiphlogistics, with leeches along the course of the inflamed vessel, applying them repeatedly and in large numbers, if the severity of the case demand it. The arm should afterwards be covered with an emollient or saturnine poultice, or an evaporating lotion. Diaphoretics and cooling saline purgatives should be administered.

When there is doubt about the safety of general bleeding (which is exceedingly useful in some cases), on account of its hastening all secondary inflammations, which are running on to suppuration, we may resort, with great success, to tartrate of antimony. In symptoms of uterine phlebitis, or any form of puerperal fever, we resort actively to large blood-letting, and leeching, and according to the peculiar character of the case, employ mercury, opium, cathartics, diaphoretics, blisters, and whatever other means we have of controlling the disease. Often one general bleeding, or application of leeches, with five grains of submuriate of mercury, and an equal quantity of antimonial powder, or Dover's powder, with cathartics, have subdued the complaint.

If, however, the phlebitis has gone on, whatever be its cause, and has reached a suppurative state, with metastatic abscess, we are called upon for a totally different mode of proceeding. Theory seems to indicate the employment of tonics, diffusive or fixed, such as acetate of ammonia, cinchona, and of sudorifics taken internally; warm applications, vapor baths; purgatives and emetics; repeated vesicatories; energetic diuretics; and, above all, calomel, to draw from the intestinal mucous membrane a considerable fluxion. Discharges from the bowels appear to be more beneficial than any other mode of proceeding. After pointing out this method, Cruveilhier concludes that our treatment should be applied chiefly in the first period, that of coagulations of the blood; for, suppuration once declared, and pus once in the circulation of the blood, medicine is generally powerless.

Velpeau (Encyc. x. Bull. Clinique, p. 65) treated a case by mercurial frictions. In his case, there reported, he says, there have been employed against phlebitis, blood-letting, compression, mercurial frictions, which have been used in almost all inflammations. During compression the inflammation continued unabated. Leeches and scarifications were equally useless. Finally, frictions with mercurial ointment had an action, whose happy result one cannot deny.

In traumatic phlebitis, with suppuration, the course of the disease is so rapid, and occurs in a constitution already stricken, with so severe a shock, that we find little time for treatment, and little benefit from it when we have time. In nine cases reported by M. Duplay (Encyc. xxv. L'Experience, p. 9), of phlebitis in consequence of amputations performed by Dupuytren, Blandin, and Breschet, the pa-

tients succumbed rapidly after the following manner. One or two examples will point out the general course of the whole.

Obs. II. Amputation of a leg in a woman aged 60, in consequence of a comminuted fracture. Union by first intention. On second day, slight local symptoms, which increased on the following days. General symptoms. Death on 17th day after operation. An abscess in the brain; another in the cerebellum. Pleurisy of right side. Abscess in the lungs. Two abscesses in the liver. Pus in the medullary canal, and in the cells of the diploe.

Obs. IV. Disease of knee-joint. Amputation of the thigh. Chills. Local accidents. Abscesses in different regions. Pus in the metacarpo-phalangean articulation, in one of the radio-carpal, and in the right scapulo-humoral. Abscess in the lungs. Phlebitis of the crural vein.

In these cases, no treatment appears to have been available, none having power to conquer the disease in all its severity.

North Andover, January 27, 1843.

[The connection of the disease, as yet fortunately but little known in this country, styled metastatic abscesses, purulent absorption, &c. with phlebitis in the suppurative stage, as ably demonstrated in the foregoing paper, we are inclined to consider as so perfectly well made out as to allow but little ground of belief that it can originate from any other primitive source except a similar affection of the absorbent system. But we must object to the mechanical, so to speak, explanation of the causation of these abscesses, as given by Cruveilhier. Any one who has seen cases of this description, the rapidity with which death ensues upon the attack, and the purulent deposites not only in the lungs and liver, but in the serous, and large and small synovial cavities, can with difficulty refuse to consider the disease as something more than the effects of a number, however infinite, of small local abscesses, as it must evidently be regarded by Cruveilhier. The blood is in some manner poisoned by the entrance of this pus; and we feel strongly inclined to look even beyond the phlebitis for the first cause, some morbid influence which has disturbed the healthy inflammation of these veins. This cause, of the nature of a morbid poison, may be the same for the difference between simple peritonitis and that of puerperal women, healthy inflammation and erysipelas, &c. Some ex-

periments which we have lately seen, as performed by a M. D'Arcet, but upon which we cannot this moment lay our hands to quote accurately, incline to the belief that ***laudable*** pus carried into the veins is innocuous; a confirmation that there is something peculiar in the nature of the original phlebitis in these cases.—EDS.]

ART. II.—*Case of Natural Labor succeeded by violent After-pains and Mania.* By EDWARD WARREN, M.D.

ON the 17th of November, 1832, I was summoned to attend Mrs. J., aged 38. I found her far advanced in labor with her ninth child. It was six years since her last pregnancy; and during the present. she had been subject to hysteria, depression of spirits, and great anxiety with regard to her approaching confinement.

I saw her at about half past five, found the pains strong; the membranes soon ruptured, with a free discharge of fluid, and the child was born at half past six; a good sized, healthy girl. In twenty minutes after, the placenta came away spontaneously; one of rather large size. There being no flooding, and the patient not exhausted, she was immediately put to bed. I visited her about two hours after this, and found her very comfortable; she had some pains, but they were slight. I left four pills, each containing one grain of camphor, and half a grain of opium, to be taken one every two hours, if they were required.

Nov. 18. Has not taken the pills, and has not slept, pains continue; is now rather nervous. Directed to take a pill every two hours.

I saw her again at five the same day, and found she had taken all the pills but had not slept. The mental excitement had rather increased. At half past five, having just had time to reach home, she sent for me in great haste. On arriving, I found her and the females in attendance in great alarm. They informed me that she had been seized with violent bearing-down pains, the lochia had ceased, and there was a great discharge of clear fluid, like water. This had given them the belief that there was a second child. On examining, during a pain, I found the uterus in tremendous agitation, bearing

down with a force such as I have rarely seen, even in the last stage of labor. At her desire, Dr. McKean, her former medical attendant, saw her with me. He suggested that the pain might possibly be induced by a portion of the placenta having been retained. By his advice, I directed her to take two grains of opium in a pill, every two hours until relieved.

19th, A. M. Has taken nine grains of opium, without the slightest effect. Has had no sleep; the pain and nervous excitement continue. The aqueous discharge has also continued. I directed hop fomentations to the bowels, a tea-cup full of strong valerian tea every two hours, and Ol. Ricin. ʒ ij. immediately.

5, P. M. The oil has not operated, but she is now much calmer; the pains have continued, but have rather diminished in force. I directed Ol. Ricini, ʒ i. to be given in one hour, if there was no previous operation. If no operation in three hours after this, an injection of oat-meal gruel. After the medicine had operated, two grains of opium, and twenty-eight grains of camphor alternately every hour.

20th. Very much better. Had the injection, which operated powerfully. Took two of the camphor powders, and two of the opium pills, and had some light sleep.

P. M. Rather more nervous. Aqueous discharge less. Medicines have continued to act on the bowels through the day. Directed to drink freely of the valerian tea; and if necessary, to continue the pills.

21st. Sitting up, quite comfortable. Did not take any pills, and had no sleep. Aqueous discharge nearly ceased, and now of rather a yellowish color. No evacuation. If none before noon, directed to take an ounce of the oil.

22d. Took three ounces of the oil before it operated. There has been a slight return of the lochia. The aqueous discharge has ceased, and the urine is of the natural color. No sleep. Has been for some time past in the habit of using soporifics.

She was now so much better, that I discontinued my attendance; but as I visited other patients in the same house, I saw her occasionally.

In about three weeks after her confinement, she got out, and soon went to hear an evening lecture by an infidel preacher, who was then producing considerable stir in the city. The bad air of a close crowded room, the fatigue of long sitting in a constrained position,

the exposure of going from a heated room into the cold—moreover the exciting doctrines of the preacher, produced, as might have been expected, a powerful effect upon her nervous system. I was soon sent for to visit her again, and found her in a very excited condition. I prescribed the usual sedatives, but without much effect. On about the fourth day after her attendance at the lecture, she arose very early in the morning, walked some distance in the midst of a violent rain, to Charles River Bridge, and threw herself into the water. She was fortunately seen, a boat was got out, and she was speedily brought home, but in a condition to keep her bed for a day or two.

Now arose the question of insanity. She could not be restrained sufficiently at home, if she should persevere in her intention of destroying herself. On the other hand, she was perfectly aware of what she had done, and could answer rationally all questions that were asked her.

An intention to commit suicide has been considered sufficient proof of insanity; and some modern medical writers have quietly set down many of the celebrated characters of ancient times, whose names have been extolled for ages, as so many madmen, because they terminated their existence by their own hand. Yet this conclusion is altogether unfounded. If Cato, for example, believing death to be an eternal sleep, and after calm reflection, considered such a sleep preferable to an existence held under certain conditions, regarding himself also as perfectly master of his own life, and suicide as a virtuous and heroic action, can we justly say that he was insane? He argued correctly according to his knowledge. His conclusions were correctly formed from the premises, and these premises were not rashly assumed, but drawn from all the light that the philosophy of his time would give.

In our day, even, let suicide once be declared to be justifiable, instead of being in the highest degree criminal and disgraceful, and it would become common. The mere love of life, or the fear of ceasing to be, is not sufficient to deter a certain class of minds from suicide, when impelled to it by mental suffering, or by the dread of disgrace. It might also be argued, that to him who believes that death is the end of existence, suicide is in many cases perfectly wise and justifiable; since it is wise of two evils to choose the lesser, and the ceasing to be is better than the endurance of mental suffering. But this discussion is out of place here, since in this case, I suppose the lecture alluded to, to have been attended merely out of curiosity,

although I do not doubt its effect, under the patient's circumstances, in producing mental excitement and unsettling her mind.

The intention to commit suicide, therefore, is not of itself a proof of insanity. But if a person, in full possession of his mental powers, able to answer all questions correctly and coherently, to draw sound conclusions from premises judiciously chosen, is nevertheless impelled by an impulse which he has not sufficient moral power to resist, to commit crime without a motive; to injure himself or to injure others; or to destroy their property or his own, he may safely be pronounced insane, and the subject of civil restraint. The public good requires his confinement. The man who is addicted to the habitual use of intoxicating liquors, and who against his will and his principles constantly recurs to what he is aware to be his bane, is a specimen of this kind of insanity, and it would be well if public provision were made for the confinement of such persons.* In like manner, an individual who has allowed himself, from infancy, to be guided by a strong passion, at length becomes insane; and although he may be prudent in the management of his property and rational in his conversation, he is nevertheless a monomaniac, and the proper subject of restraint. Cases of this kind are mentioned by M. Esquirol, who has so justly drawn the distinction between mental and moral insanity.

In such cases it is a matter of no small difficulty to draw the line between sanity and insanity, and it was with some hesitation that I signed the necessary certificate. It was her own wish, however, as well as that of her friends, and in fact the only means of restraining her from mischief, that she should be removed to the Hospital at Worcester.

There she remained for several months with some improvement, though not sufficient to induce the physician to discharge her as cured, until her husband, getting out of patience, insisted upon her return. On her return home, I found her calmer, though not disposed to allow that she had received much benefit. After this, she continued pretty much the same, with some slight improvement, complaining most of the time of pain in the back, indigestion, or bad feelings at the stomach, headache, &c. I gave her chamomile, quassia, valerian, and similar medicines, and there was some improve-

* It differs, it is true, from true insanity, by being temporary and kept up only by the action of a particular cause; but if the action of this cause is continued sufficiently long, the effect becomes permanent, and no one hesitates in pronouncing the subject insane.

ment from year to year. She had abandoned all disposition to commit suicide, though in one instance, indeed, she attempted to throw herself out of the window; but as the attempt was made in the presence of her husband and a grown up daughter, by whom it was easily prevented, it was considered merely as a feint, and the result of obliquity of temper.

In 1838, she became again pregnant, and during this pregnancy her health improved. She had none of the unfavorable symptoms which attended the preceding. In August, 1839, she was delivered of a healthy boy. The labor was as rapid as the preceding, but in all respects favorable. After her recovery, she continued cheerful, and in all respects better than I had ever seen her before. Having lost her last child by lung fever in 1835, it is possible that the constant anxiety with which she watched over the health of this one, had a favorable effect upon her mind, by diverting it from the consideration of her own health and the concerns of her family; her husband being intemperate. However this might be, she continued in good health of body and mind when I last saw her in 1841.

Remarks.—One of the principal circumstances attending the labor first described, was the violence of the after-pains, and the suddenness of their occurrence. As they gradually subsided, without the discharge of any portion of the placenta, and as this mass came away spontaneously and apparently whole, they could not have been produced by a cause of this kind. How far they might have been excited by mental causes I will not undertake to say. I have never seen after-pains in any degree so violent, in any other case. The quantity of opium taken within a short period, without any apparent effect, is another circumstance worthy of attention. Very large quantities of opium or laudanum are often given in spasmodic disorders of the stomach, &c., without producing sleepiness or any subsequent effect whatever, except obstinate constipation. It is remarkable that as soon as the spasm or pain ceases, the opium which has no means of escape from the system, unless it is by perspiration or exhalation, does not produce its usual effects. We should naturally suppose that as soon as the pain or spasm ceased, the opium would begin to act. We find, however, that this is not the case; the patient is as wakeful, rational, and free from nausea, as if no opium had been taken. The large and continued discharge of aqueous fluid, was another remarkable feature of the case. I considered at the time that this was produced by a large accumulation of fluid in

the serous vessels of the abdomen and the thighs, occasioned by the pressure of the gravid uterus, and that this was the cause of the bad symptoms which had attended her pregnancy.

The manner in which the mental disturbance came on with the first pregnancy and subsided with the present, is also worthy of note. It is obvious that any cause which produces so powerful a change in the system as pregnancy and labor, may produce an effect either beneficial, or the reverse, as the case may be.

December 27, 1842.

ART. III.—*On some of the Circumstances which determine the Food of Man.* By AUGUSTUS A. GOULD, M.D., Boston. Read before the Boston Society for Medical Improvement.

THE subject of the kind of food best adapted to the anatomical structure and physiological well-being of man, is one which has been, and doubtless will continue to be, much agitated. That man may eat vegetables, seems to be universally conceded; and the mooted point is, whether he may also eat meat. Very early records, whether sacred or profane, distinctly inform us that animal food was a part of ancient diet. It was distinctly specified in the Mosaic law that certain animals were clean for food, and others were unclean. But modern caprice or necessity has shown that all the animals proscribed as unclean, are digestible, nutritive, and not unpalatable, at least after subjection to culinary processes, and when well savored with condiments. Pork is one of the staple articles of our country; and few among us abhor it in any form. Baron Larrey informs us that horse soup is very palatable; and Mr. Catlin almost causes our mouths to water, while he depicts the relish with which the prairie Indians engage in their dog-feasts. The Igana is a favorite food of the Texans and Mexicans; and who now-a-days declines a good turtle soup? All these animals were unclean to the Jew. So, too, the African eats ants and grubs and serpents; and while we smile, at the Mahometan Arab, who feasts on locusts, he smiles with equal complacency when told that Americans eat crabs and lobsters.

Though history and science and common sense seem to have sufficiently corroborated the dietetic maxim, "*sanis omnia sana*," showing not only that man *may*, but that he *should* be omnivorous;

yet as Grahamism and physiological societies are still somewhat in vogue, it may not be amiss to take a glance at the anatomical and physiological reasons which support this view. The facts will not be new, and they must necessarily be brief.

The anatomical and physiological differences which are regarded as indicating the appropriate food of an animal, are to be looked for in his organs of prehension and manducation, the alimentary canal, and in geographical relations.

Cuvier labored, most successfully, to establish the relation which the teeth bear to the organs of prehension and the structure of the skeleton in general, so as to be able to draw from the teeth alone, well-grounded generic characteristics. His labors on this point have been further carried out by Fred. Cuvier, and since the researches of Mr. Owen into their internal structure, the teeth have assumed a new importance as distinctive characters. So that, so far as regards the mammalia, the teeth are now considered the most infallible marks of both generic and specific distinction; and the dental formula always enters into every specific description. This natural ground for arrangement has been carried into the other orders of animals; so that even in the insect tribes, the trophi, or organs of manducation, are always examined; and so far as they have been examined, they afford characteristics equally us unvarying as in the mammalia; and the distinction between the membranous jaws of the vegetable feeders and the ivory mandibles of the predaceous beetles, is even more remarkable than between the teeth of the carnivora and herbivora among the mammalia. So, too, the slender limbs and rapid bounds of the tiger-beetle as infallibly indicate his fitness for a predatory life, as the curved claws and supple frame of the feline race. The same adaptation of parts is found throughout the whole series of animals.

I need not say that the indications of the natural food of an animal, as derived from the teeth, are drawn from the form of the terminations or points of the teeth, and from the manner in which they are allowed, by the articulation of the jaw, to come in contact with each other. As to the terminations of the teeth, there is every possible variety between the broad, flat, rasping teeth of the elephant and some of the Rodentia, and the pointed and sharp-edged teeth of the tiger. In these instances, the proper food is unequivocal; and according as, in other animals, the teeth combine the peculiarities of these types, so is their food judged, *a priori*, to approach to the purely vegetable or animal character. In all extreme cases, observa-

tion proves this indication correct beyond dispute; but in the intermediate cases it is not so easy to determine—and in no case is there more open ground for discussion than in that of man, who, by his dental formula, is placed intermediate between the extremes of animal and vegetable feeders. He has neither the broad teeth of the horse, nor, like him, a destitution of opposing incisors; nor has he the lengthened canine teeth, nor the sharp-edged, pointed, carnivorous teeth of the dog. The articulation of his jaw is not transverse, and admitting only a vertical motion as in the lion, nor is it longitudinal, allowing a rasping motion backwards and forwards as in the beaver; but is constructed so as to admit of a free rotary movement, or of simple upward and downward motion, as may be desirable.

Men, however, who seem not to be willing that the chain of nature should be continuous, heedless of the maxim that *natura nihil per saltus fecit*, and not content with anatomical indications or the deductions of analogy, must needs put forth their efforts in endeavoring to prove that man is constructed for a vegetable feeder, and was designed to be so exclusively; when the utmost of the amount of their argument seems to be, that because it is found that man *may* live very well on vegetables exclusively, therefore vegetables are his appropriate food.

The teeth may well be regarded as determining the nature of the food to be masticated. Wherever we find broad and flattened or tuberculated surfaces terminating them, we may safely say that vegetable food may enter into the diet of that animal. Wherever we find canine teeth, and sharp-edged or pointed cheek teeth, we may pronounce the animal to whom they belong to subsist upon flesh. The development of the canine teeth, however, is not a measure of the carnivorous propensity of an animal, for they are more developed in the wild boar and the babyrouessa, than in the lion and tiger. They are more developed in the ourang outang than in man, though the former is supposed seldom if ever to partake of animal food when he can obtain fruits. They are never wanting, however, in the carnivora, and when combined with the sharp cheek teeth, always indicate a capability of taking and digesting animal food.

One exception, at least, may be stated to the remarks just made. The Orycteropus, or ant bear, which feeds on insects, has the teeth smoothly truncated. This exception, if it be one, serves only to prove the rule. The teeth have no eminences or layers of enamel, like the broad teeth of graminivorous animals, but are perfectly smooth

and exactly calculated for reducing the little insects on which they feed, to a proper state for digestion.

As to the mammalia, we might be satisfied with the information to be obtained touching their natural food, from the structure and arrangement of the teeth alone, especially when taken in connection with the organs of prehension. By these alone the habits of extinct animals, whose solid parts only remain, are determined; and all other parts of the skeleton are found to conform to the habit thus indicated. But we are not left to rest on this evidence alone in animals whose soft parts may be examined. The alimentary canal also affords almost unequivocal evidence as to the habitual food of an animal, independent of every other consideration. As a general rule, the stomach is simple and the intestinal canal is comparatively short or of small extent of surface in the carnivora. It is complicated, and the canal long, in the herbivora; and there is a corresponding modification in the structure of the stomach and length of the intestines where there is a mixture of animal and vegetable food, in whatever proportions. These modifications take place in different parts of the canal, and are so various in combination, that though the general rule is well established, there are many apparent exceptions, which must remain such till the relative importance of each portion of the canal is better understood.

The stomach seems to be more certainly indicative of the kind of food for which it is designed, than does the rest of the canal. In this organ the aliment is reduced to a homogeneous mass, and very soon after leaving it the ingesta seem to have assumed the state in which they may be taken into the circulation; so that the long tract of intestines seems to be designed rather for presenting the nutrient matter, as it is moved along, to the mouths of the absorbing vessels, than for any very active process of assimilation. That they are of some importance, however, other than as mere absorbing surfaces, is evident from the numerous modifications in size and proportionate length which they exhibit.

We might reasonably predict, therefore, that the stomach destined to receive aliment already nearly assimilated to the system, would be much more simple than one in which articles that have not already assumed an animal organization are to be received. And so we find it. The stomach of the carnivora is a simple, smooth, membranous bag, with no arrangement for preventing a speedy passage of food through it. The stomach of the herbivora, on the contrary, is mul-

tiplied and complicated—and in the ruminating animals especially, there is not only a succession of digestive pouches, arranged in such a manner as to cause great delay of the food in them, but a provision by which the nutrient mass may be raised into the mouth again for further mastication. There is every intermediate modification between these two extremes; and man, with a stomach prolonged at its cardiac extremity, lined with its corrugated mucous membrane, and closed by its rigid pylorus, would, on this account also, seem designed for a mixed diet.

The intestinal canal, as I before observed, affords a much less certain indication of the food it is intended to receive than the stomach. As a general rule it is found to be long in herbivorous and short in carnivorous animals. In the lion it is only three times the length of the body—in the sheep it is twenty-eight times—in man it is set down at five and a half times the length of the body. But it should be remembered that in the length of a man's body we reckon the lower extremities, while in quadrupeds we measure from the tip of the nose to the tuber ischii. Calculating for man in the same way, the intestinal canal would be at least ten times the length of the body. But there are some carnivora that have the canal proportionably as long as even the sheep, such as seals and porpoises—while the sloths, which are exclusively vegetable feeders, and some mice, have them as short as the lion. There are several modes of compensation, however, which will go far to reconcile these apparent discrepancies from the received theory.

One is, that when the canal is short in a vegetable feeder, its capacity or diameter is large; and on the other hand, where it is found to be very long in carnivora, its diameter is small and its interior smooth. The proportion of the diameter to the length varies greatly—so that while in the shrew-mole, where the intestine is unusually short, the proportion of length to breadth is only as 19 to 1—and in the hyena, where the canal is much longer than in other carnivora, Cuvier gives the proportion as 110 to 1. It will be at once seen that so great a diversity will go far to explain apparent exceptions. It is the extent of the absorbing and delaying surface to which the food may be presented, rather than the actual length of the canal, which should indicate an adaptation for vegetable or animal food. Add to this, that in some animals the interior of the tube is obstructed by folds and corrugations of the lax mucous membrane, while in others the membrane is tense and its surface smooth. Let the diameter of the

tubes be the same, and their interior of similar character, and we shall find the tube of the herbivora invariably longer than that of the flesh eater. Moreover, in others, the size and length of the cæcum presents another important modification, and in some animals this organ is multiplied. The proportion of the length of the small and large intestines, too, are ever varying; and in addition to all this, it is found that the temperament of an animal produces varieties; for instance, the sloth, in his habits, is what his name imports, and the action of his organic functions is as dilatory as his locomotion. His vegetable nutriment would therefore be a long time retained in the alimentary canal, although it is a very short one.

These are some of the practical difficulties met with in attempting to deduce from the length of the intestines a general rule by which to decide with certainty as to the food they are designed to receive. Still, when we so constantly find, in the extreme cases, that where we have carnivorous teeth, they are succeeded by a stomach, and this by an intestinal canal, of a remarkably distinct character, such as we ascribe to a carnivorous animal; and that when we have flat, grinding teeth, we in like manner have an equally peculiar but very different stomach or canal, and know these to belong to an animal feeding exclusively on vegetables; we ought not to be too sceptical as to the intention of the intermediate forms, especially when experience proves their capability, if not their fitness, for digesting a mixed diet of animal and vegetable food in various proportions. In no case is the fitness of things better illustrated than in the two tribes of bats, one of which is frugivorous and the other insectivorous. In the first tribe the teeth have flattened crowns, and the stomach is complicated, as in other vegetable feeders. In the second, or insectivorous tribe, the teeth are surmounted by conical points, and the stomach is very nearly allied to those of the true carnivora.

In addition to this, there must be the capability of procuring the food for which the digestive organs seem designed. The cat tribe are evidently well calculated for predatory animals. The hawk might scratch the earth for seeds or insects, like the gallinaceous birds, but he would find it difficult to pick them up with his beak. The duck might pursue the smaller birds with nearly as much velocity as the hawk, but he would have no means of securing the prey when overtaken. The bear is provided for attack and defence, in contending with animals whom he makes his prey; but he is also capable of climbing trees, and providing himself with fruits, when

necessity or inclination prompts. The wild boar is in like manner capable of capturing prey; but he is also provided with a snout for turning up the earth in search of roots: these last are therefore promiscuous feeders. If we look at man, we find him having dominion over the fish of the sea, the fowl of the air, and over all the cattle and every creeping thing. None of them can elude his vigilance, and although naturally the most defenceless of all animals, yet nothing can overcome or withstand his arts. May we not conclude from this, also, that man was structurally designed to partake, beneficially, of whatever of all these things best pleased him?

There is one other element in the condition of man, which seems to me to be of considerable importance in determining, not only his omnivorous nature, but also the proportion in which the different kinds of aliment should be used. It is, that man may be and is a resident in all climates and regions; while in some regions he can never be sure of suitable animal food, and in others, and I refer to the tropical regions, if he can procure animal food, the much more ready and abundant supply of nutritious vegetables leads him to choose them almost exclusively. In the frozen regions, vegetation is bound beneath frost and snow during nearly the whole year, and the brief space of seedtime and harvest cannot be depended upon to supply the wants of the remainder of the year. In Iceland, it is said that bread is unknown, as a common article of diet. The inhabitants of those northern regions subsist upon, and relish, the flesh of the reindeer, seal, whale, and other marine animals, such as our stomachs would abhor, and such as would probably prove even indigestible to them, in more temperate climates. In the regions of tropical heat, on the contrary, nutritious vegetables grow profusely and almost spontaneously, so as to constitute nearly the whole diet of the unnumbered millions of those regions. It is said that five or six days labor in a year will secure the growth of plantains enough for the support of a family. There, too, is rice, a grain which feeds as many people as all other grains united; the banana, the bread-fruit, the cocoa-nut, sago, tapioca, cassava, arrow-root, yams, and other vegetable productions, which furnish inexhaustible stores of supply. There, wild animals are for the most part carnivorous; the nature of the vegetation is not adapted to grazing, and ruminants consequently degenerate as articles of diet. In the temperate regions we have a good grazing country, and beef, mutton, and venison are found in their greatest perfection; while the cereal grains, though various and

excellent, are not produced to an extent to render it prudent to depend wholly upon them for subsistence.

Now, while we argue that, as man's constitution enables him to adapt himself to all climates and all vicissitudes, therefore he must be organized so as to subsist upon whatever food may be available in any position; may we not also argue that, as nature in one region provides the greatest profusion of vegetable nutriment, while in another little else than animal food is to be obtained, she thereby indicates the proper diet in each region—the diet which is the best adapted to the greatest integrity of the human system. Whatever be the reason of this, we know the fact, that while man at the frozen regions is compelled to live on fish and flesh, man at the equator lives almost exclusively on vegetable food; and the laboring man in the temperate zones lives upon a mixed diet. Vegetable food seems to supply all the demand of the system in warm climates, where the heat precludes severe or long-continued exertion. In the cold climates, where there is a great expenditure of animal heat, the stimulus of animal food may be requisite. Each of us has experienced how different is our appetite for animal food in summer and winter, and how much more moderate is our desire for food when enervated by the heat of summer, than when invigorated by the cold of winter.

If we take for granted what seems to be so well supported by theory and practice, that man is best suited with animal food at the poles, and with vegetable food at the equator, may we not, with a great degree of accuracy, assign to a man the proportions of animal and vegetable food proper for him, by the degree of latitude in which he lives. In this prescription we must take into consideration the admitted opinion of comparative anatomists, that the digestive organs of man indicate him to be more of a vegetable than of an animal feeder; so that at 45 degrees of latitude it would not be suitable for a man to take equal quantities of vegetable and animal food, but a preponderance of vegetable food; and so on, diminishing the proportion of vegetable food as we proceed to the poles, and of the animal food as we approach the equator.

May we not also deduce rules from this theory for the regulation of the diet of the different temperaments and occupations of men, in any particular region—rules which experience proves to be judicious, though drawn perhaps from other grounds. For instance, if we in Boston should find a man of sedentary habits, little exposed to the

vicissitudes of weather and leading a sluggish life, such as charcterizes the inhabitants of warm countries, should we not say that his diet ought to be principally vegetable? And on the other hand, should we not approve of an additional proportion of animal food for the man whose occupation involved vigorous exercise, or who was required to be fortified against great exposure from any cause? Such, at any rate, is the diet which we find adopted by men in the conditions to which we have alluded, from natural craving; and under a diet thus modified, they respectively maintain the state of body most suitable to their vocation.

It is no argument on the contrary, to say that every herb and every tree or its fruit was prescribed to man for food in the garden of Eden, for it was prescribed in like terms to every beast, fowl, and creeping thing also; or that there is reason to suppose that in primitive times man's food was exclusively vegetable; for on the ground of antiquity we might with equal reason contend for nudity, or the fig-leaf apron, or the troglodyte cave, as the proper habiliment and habitation of man.

I have not attempted to show that man cannot subsist without animal food, for it is plain that he can; or that he is not better off without animal food than with it, for it is also plain that under many circumstances an exclusively vegetable diet is best. But I think it is also plain that his organization provides that he may be omnivorous; his adaptation to procure all kinds of food allows him to be so, and his capability of inhabiting all climates requires him to be so. And I think also, that the proportion of animal and vegetable food best for him may be calculated on the general principal of his distance from the equator, combining, in the calculation of individual cases, temperament and occupation.

ART. IV.—*Have Variola, Varioloid and Varicella a common origin? A few considerations and cases bearing upon this question.* By WM. EDWARD COALE, M.D.

IT is now nearly twenty-three years since a formal proposition of the above question was made. It is true, that long before, many writers had noticed occasional resemblances between the three diseases, and in two or three, something approaching a suggestion of

the possibility of their close connection may be found, but their suspicions and surmises never seem to have been supported by any particular experiments or observations. Morton, in his work upon small-pox, published in 1694 (quoted by Dr. Thomson), describes minutely the different forms of these three diseases, applying for the first time on record, the term *chicken-pox* to the mildest, and seems to consider them as merely varieties of one disease. He also considers the difference between these varieties as often depending upon the patient having previously been affected with small-pox. Two other writers, also quoted by Dr. Thomson, one of whom, he says, may be considered as echoing the opinions of the Leipsic school of that day (1700), express the same views with Morton; but in the remainder of the quotations by Dr. T., from many of the writers of the two last centuries, I cannot see much to support the assertion, that "all the varieties of this disease, whether mild or malignant, distinct or confluent, vesicular or pustular, genuine or spurious, chicken-pox, swine-pox, sheep-pox, wind-pox, stone-pox, and horn-pox, have generally, if not universally, been supposed to have had only one origin." *

In the year 1818, Dr. Jno. Thomson, then attached to the military hospital at Edinburgh, had his attention much excited by the simultaneous prevalence of three marked varieties of eruptive disease. One of these was the genuine confluent small-pox; another, a milder disease, more irregular in its phases, the varioloid; another, a very mild vesicular disease, of short duration, the chicken-pox. Of three persons exposed to the same influences, he found that each one might have the disease in a form different from the others. The paper suggested by these observations, together with many cases, will be found in the Edinburgh Medical and Surgical Journal, No. 56, and also in the appendix to Dr. Thomson's letter to Sir James McGregor, published in London in 1820. Dr. T.'s views are still further set forth in his "Historical Sketch of the opinions entertained by medical men upon the varieties of Small-P x," published in London in 1822, quoted from above.

Since the above publications, the question has been much discussed, and it would be difficult now to say what is the prevailing opinion. Some consider varioloid a modified small-pox; others look upon it as a distinct disease, though, singularly enough, many of the

* Historical Sketch, &c., &c., p. 30.

latter allow that chicken-pox is an abortive small-pox. Some, again, associate varioloid and chicken-pox, and only defend the distinctiveness of small-pox. I might quote authors in numbers, but there would be neither time nor place to make an analysis of their many and varied arguments. Rayer (Maladies de la Peau, tom. i. p. 509), who advocates the identity of the three forms of variolous disease, takes a comprehensive view of the arguments both for and against his side of the question, and answers the latter in detail.

In the arguments of Rayer and of others, one thing has struck me, a defect in the evidence. In no instance is it clearly and indubitably shown that but one contagion was at work. It is true, that several make their defence very good upon this point, but there still is a loop-hole left for doubts. In the following relation I think that I have supplied this defect in the evidence upon the *identity* side of the question, and striving to avoid any suggestions of my own, I give the cases for what they may be worth, premising that the facts now offered presented themselves to me with my mind perfectly unbiassed.

The U. S. frigate Columbia, to which I was attached as one of the assistant surgeons, left Norfolk, May 5th, 1838, and arrived at Madeira (Funchal) on the 27th. Sailing thence June 3d, she arrived at Rio Janeiro July 10th, whence she sailed on the 29th. Up to this period the health of the crew had been comparatively good, since leaving the United States. At Rio, the small-pox is always, I was told, more or less prevalent. Either at my first or last visit (I cannot now recollect which), two slavers were lying near us, on board of which the disease was committing dreadful ravages, and during the stay above-mentioned, the hospital of the *Misericordia* had one large ward, at least, filled with patients affected by it. This hospital several of the officers visited. The men were not permitted to go ashore, except the crews of one or two boats—in all, probably, twenty-five in number.

Twenty-eight days after leaving Rio (Aug. 26), one of the midshipmen, who had been upon the station for some months, was seized with a pain in the head, then attributed to rheumatism, to which he had been subject. The accompanying fever was slight, and seemed to yield readily to saline purgatives, with small doses of ipecac. Sore throat. A few vesicles made their appearance upon the third day, but trifling in size, conical in shape, and containing watery fluid, drying away, forming no scab, and leaving no cicatrix. Discharged Sept. 2.

Mr. I., sleeping in the same steerage with the last, came upon the list also upon the 26th of August. Considerable fever, flushed face, deeply reddened tongue, bad taste in mouth, fœtid breath, nausea. R. Sub. mur. hydrargyri gr. x.; Ol. Ricin. ʒ j. 27th. The excitement much the same. R. Sal. Epsom, ʒ ss.; Magnes. ust. ʒ ss. 28th. No fever. Eruption appearing, small in size and conical in shape, and containing purulent fluid. Upon the 5th day of his being on the list, sore throat but no fever. 7th day. Eruption disappearing. Many of later pimples did not come to maturity, but were mere vesicles, and dried away without scabbing. But two very trifling cicatrices were formed. He was discharged Sept. 14, having been kept upon the list for several days merely as a preventive against the effects of inclement weather.

The same day that Mr. I. was discharged, Mr. H., of the same steerage, was taken with very similar symptoms, highly flushed face, excited pulse, fœtid breath, furred tongue, nausea and vomiting. R. Rhei. gr. x.; Sub.mur. Hydrargyri, gr. viij.; Syrup Sarsaparilla, ʒ jss. M. Sept. 15. Fever less, but much headache, and continued nausea. No operation. R. Rhei et Magnesia, aa. gr. xx. 16th. Fever less, feels better, eruption appearing. Bowels but slightly moved, repeat Rhei et Magnesia. 17th. Fever and gastric irritability gone, eruption well developed, exactly resembling the last case, both in its appearance and in the period it required for its various stages. These three had been vaccinated.

On the same day with the last (Sept. 14th), A. C., a marine, was attacked with the same symptoms, except that there was much more dryness of skin. R. Sub. mur. Hydrargyri, gr. xij.; Ipecac, gr. xx.; Tart. Antim. et Potassa, gr. ij. M. 15th. Free from fever. R. Salts and Magnesia. 6, P. M. Return of fever, headache, very dirty tongue, pulse very full and hard. V. S., with much relief. 16th. Pulse much softer, and all symptoms ameliorated. From his face being already plentifully covered with small pustules, the first appearance of the eruption was not noted, but during the following four days it broke out very profusely, and on the 20th it presented large flattened pustules, very numerous, and in many places on the legs confluent to the extent of four and five square inches. The development was gradual, and the pimples that appeared last were much smaller than the first, more conical, and did not pit in the centre, but gradually dried away without scabbing. Treatment, lemonade and cranberries. 23d. Scabbing commenced. 26th. Scabs

falling off. Oct. 2. Left his bed. Discharged Oct. 13. The eruption left many very evident cicatrices, particularly where it had been confluent. ***He had never been vaccinated.***

Oct. 1. W. K., landsman, had a slight fever, headache, nausea. R. Ipecac, gr. xx.; Sul. Cupri, gr. x. M. Vomited freely. 2d. No fever, slight pain in back, supposed rheumatic. R. Comp. decoct. of Quassia and Guaiac. freely. 3d. Felt well. 4th. Discharged at request. 6th. Returned with general malaise. No fever. Many small vesicles appearing on face. 7th. Debility increased. Eruption in different stages, very profuse. Lemonade. 8th. New pustules appearing, others disappearing. The majority large, with depressions in the centre, and confluent only in three or four places, and merely to the extent of two or three pustules. The eruption dried at different periods, the last pustules being abortive, as in the other cases. Discharged 12th. But few marks were left, only I believe where the irritation was increased by picking. He had been vaccinated.

E. M., admitted Oct. 2. Symptoms much as in the previous case. R. Salts and Magnesia. 3d. Tongue still coated, breath fœtid, skin moist and hot, discharges frequent, pulse small and frequent. R. Sub. mur. Hydrargyri, gr. xx.; Tart. Antim. et. Potas. gr.ij.; Opii. gr. ij. M. et divid. in chart No. 4, one every four hours. Arrow-root. 4th. Skin good, tongue still dirty. R. Salts and Magnesia. 5th. Bowels well moved, no fever, pulse feeble, anorexia. 6th. Eruption appearing in small vesicles. It differed from the last in the vesicles being more conical, smaller, and no where confluent. Discharged Oct. 13. Had been vaccinated.

H. T., negro, admitted Oct. 13. (Had been subject to frequent attacks of high rheumatic fever.) Fever, foul tongue, pains in head and back. R. Ipecac, gr. xxx.; Sulp. Cupri, gr. x. M. et divid. in chart No. 3, to be given at 15 minutes interval. 14th. Increase of pain, tongue still foul, cough and pain in chest. R. Salts and Magnesia, blister to chest. 15th. No fever, continuance of pain and of foulness of tongue. Free action from yesterday's prescription. R. Siedlitz Powder. 16th. All symptoms abated. Some doubtful appearance of vesicles. 17th. Vesicles conical, seldom exceeding 3-16 of an inch in diameter, well developed and plentiful, but not confluent in a single instance. R. Lemonade. 22d. Eruption drying. Detained on list some days longer with a headache. Had been vaccinated.

E. H. had been on the list for some time with chronic dysentery, from which he was recovering, when after three or four days headache, the eruption broke out upon the same day that the last was admitted. The eruption was not confluent, and resembled the last very much. No treatment. This man had been in the sick bay all along with the preceding. He had been vaccinated.

J. M. had been on the list for some time with an irritable ulcer, and had been all along in the practice of coming into the bay twice a day to have his ulcer dressed. After symptoms similar to those of the above, the eruption appeared in large flattened pustules, confluent in many places to a great extent, but not appearing simultaneously, there being visible at the same time some in every stage. 24. Eruption at its height. 25. Sore throat. Much irritation of skin, particularly in neighborhood of ulcer. R. More generous diet. Nov. 1. Eruption drying rapidly. 5th. Well washed; some discolorations left, but no pitting. Had never been vaccinated.

Besides these, there were fifty other cases which it would be unnecessary to detail at length. The three last given, may be taken as the average type of the other fifty, with the following exceptions.

F. McQ. had been on shore at the garrison town of Columbo, island of Ceylon, where he had a severe debauch. Three days after, he was seized with symptoms similar to those recorded above, but exceedingly violent. The eruption appeared on the sixth day, and simultaneously on all parts of the body. The pustules were large, depressed in the centre, and confluent. There was much tumefaction of the face. The mucous lining of the mouth and fauces was studded with pustules as far as could be seen. By the twelfth day of the disease, scabbing had proceeded, accompanied with much secondary fever. Death took place on the fourteenth day of the disease (Dec. 16), the immediate cause being suffocation from the pustules in the air-passages. No record as to whether he had been vaccinated.

Now here I must note the apparent discrepancy with my statement that the evidence as to there being but one contagion, is indubitable. He had been on shore, it is true, but it was at a garrisoned town, or rather a mere fortress entirely under military discipline, and where the medical police, in particular, I am assured, from excellent opportunities of informing myself, is very perfect. Particular inquiries were made by our fleet surgeon, Dr. Jno. Haslett, whether any eruptive disease was prevailing, and he was assured that

nothing of the kind had been known there, and had any variolous disease existed, even to a single case (not a probable condition), it must necessarily have been known to the medical director.

Five days after the death of the last, N. T., a healthy, temperate negro, was seized with the usual premonitory symptoms, which were not very severe. The eruption of large flattened confluent pustules was very profuse, appearing and coming to maturity in a short space of time. With the eruption was much tumefaction of the face. This man died of the severe secondary fever, which set in during the scabbing (Jan. 5, 1839), fifteen days from the commencement of the attack. He had not been vaccinated, or at least no proof could be obtained that he had been.

W. G. was seized with the usual symptoms. They yielded soon, and he was discharged from the part of the ship reserved for those attacked with the variolous disease. After his discharge, he discovered several conical vesicles which he showed me, and which resembled those in the second case mentioned. He was remanded to the part of the deck screened off, until the vesicles should dry away, which they did in a few days. Whilst he was thus confined, the only other inmates of the infected screen were two who had been attacked about the same time. Of these, W. V. had the premonitory symptoms very severely. The eruption was tardy in making its appearance when compared with others of similar violence. The pustules were large, flattened, very numerous, confluent to a very slight extent. The progress of the disease was marked by nothing peculiar. Convalescence was very tedious from two causes, great debility, though previously a very strong hale man, and excessive irritability of the eyes, one of which had been attacked by a pustule. This man was very much pitted by the disease. There was no evidence of his having been properly vaccinated. The other inmate of the screen was H. L., a young man of good health, but naturally of slender make and but slight bodily strength. The premonitory symptoms presented nothing remarkable. The eruption was very much as in the last case, profuse, slightly confluent, and attended with much tumefaction. The scabbing made considerable progress, but the secondary fever set in, his powers of life began to fail, and he succumbed, in a typhoid state, on the twelfth day (Jan. 14) of the attack. He had the mark of cowpock upon his arm.

From this time the disease decreased in numbers and violence, with one exception to the latter. I. M., æt. 21, a pale, delicate

looking lad, had been confined to his cot for a month with a debility which seemed unaccounted for. During the last two weeks he had complained of pain in his groin and hip-joint, and three days before the eruption appeared, he had rigors and hectic—his system in the mean while apparently sinking rapidly. On Jan. 25, a miliary eruption appeared around his left eye. The next day I was myself taken with the disease, which precluded personal observation, but being very much interested in the individual, and in the case, I was constant and particular in my inquiries. The eruption was ushered in by no other symptoms than those just mentioned. It was profuse, confluent in many places, with much tumefaction. The scabbing was attended with severe secondary fever; on the second day this was accompanied by subsultus tendinum, and apparently dissolution was at hand. The next day a change had taken place for the better, and his convalescence, though slow, was uninterrupted. Many of the scabs did not drop off until the third week. The proofs of vaccination were too uncertain to place any reliance in them. I may notice a singular fact in this case, viz., that the lad, who had before the attack been delicate even to effeminacy, and who had seemed to be sinking under some slow and obscure disease, after his recovery was so seamed and pitted as to lose all trace of his former appearance, and became one of the stoutest and heartiest men in the ship.

As I have above incidentally mentioned, I was attacked by the disease myself after it had been on board the ship just five months, during which time I had been almost hourly among the infected. The premonitory symptoms were severe, the eruption appeared upon the sixth day, coming out at successive periods, the last vesicles being abortive. The scabs had almost entirely fallen upon the twelfth day, and but few cicatrices were left.

After this there were but three more cases, two of the simple *conical vesicular* form—the other in a gentleman now a lieutenant in the navy. He had nursed the young midshipman mentioned in the third case, with the most unremitting care—scarce leaving his bedside day or night. Then he escaped. Five months after, whilst I was confined behind a screen, he looked in but once and only for a moment. Two weeks after he was attacked, and had the disease to about the same degree with myself. I mention this merely incidentally—not as a clear case of direct contagion. No new cases occurred after March 1st, 1839.

It will be seen that the disease prevailed a little more than six

months—during which period the ship visited the following ports: Muscat, Oct. 17th, 1838—Bombay, Nov. 1st—Goa, Nov. 14th—Columbo, Nov. 24th—Coast of Sumatra, Dec. 21st—Pulo Penang, Jan. 25th, 1839—Sincapore, Feb. 3d.

At none of these places, after the most diligent inquiries, could we hear of any variolous disease prevailing; and our means for obtaining information upon this point were very ample, both from the constituted authorities, and from personal acquaintances among the faculty, many of whom came to visit our patients. At all these ports the ship lay more than a mile, and at many, more than two miles from the shore, and the men were not permitted to visit the shore, except the gig's crew, of whom F. M'Q. was the only one attacked.

Then the question comes, What was the disease? In the three first cases, in that of W. G. and in the two last, marking the commencement, the middle and the end of the period of six months, the disease was entirely vesicular, and answered to all the symptoms given as those of chickenpox. The remainder of the cases, with the exception of the three fatal ones, and those of W. V. and I. M., correspond to the descriptions given of varioloid, in the irregularity of the phases and the slightness after the symptoms of the first day or two. The five exceptions are the only cases in which it appears to me there can be a doubt as to the name of the disease. Were they merely cases of aggravated varioloid, or of genuine smallpox? If of the former, what are the characteristic distinctions of the latter? All of those laid down by the most approved authors seem to have been present—the suddenness, the violence of the attack, the simultaneous appearance of pustules in all parts of the body not in successive crops, the accompanying tumefaction, and the secondary fever.

I repeat that the above observations were made without the slightest bias of my mind towards a belief in the identity of the three diseases; indeed, on looking to the opinions expressed in the works which I then had with me, I find they are decidedly opposed to any such belief.

It appeared to me that the late prevalence of variolous disease in Boston made this a favorable time for putting forth these remarks, which I do in hopes that others of more extended opportunities of observation might be induced to contribute something to the consideration of the question which heads this paper.

ART. V.—*The Contagiousness of Puerperal Fever.* Read before the Boston Society for Medical Improvement, by OLIVER W. HOLMES, M.D., and published by request of the Society.

IN collecting, enforcing and adding to the evidence accumulated upon this most serious subject, I would not be understood to imply that there exists a doubt in the mind of any well-informed member of the medical profession as to the fact that puerperal fever is sometimes communicated from one person to another, both directly and indirectly. In the present state of our knowledge upon this point I should consider such doubts merely as a proof that the sceptic had either not examined the evidence, or, having examined it, refused to accept its plain and unavoidable consequences. I should be sorry to think with Dr. Rigby, that it was a case of "oblique vision;" I should be unwilling to force home the *argumentum ad hominem* of Dr. Blundell, but I would not consent to make a *question* of a momentous fact, which is no longer to be considered as a subject for trivial discussions, but to be acted upon with silent promptitude. It signifies nothing that wise and experienced practitioners have sometimes doubted the reality of the danger in question; no man has the right to doubt it any longer. No negative facts, no opposing opinions, be they what they may or whose they may, can form any answer to the series of cases now within the reach of all who choose to explore the records of medical science.

If there are some who conceive that any important end would be answered by recording such opinions, or by collecting the history of all the cases they could find in which no evidence of the influence of contagion existed, I believe they are in error. Suppose a few writers of authority can be found to profess a disbelief in contagion—and they are very few compared with those who think differently—is it quite clear that they formed their opinions on a view of all the facts, or is it not apparent that they relied mostly on their own solitary experience? Still further, of those whose names are quoted, is it not true that scarcely a single one could by any possibility have known the half or the tenth of the facts bearing on the subject which have reached such a frightful amount within the last few years? Again, as to the utility of negative facts, as we may briefly call them,—instances, namely, in which exposure has not been followed by disease,—although, like other truths, they may be worth knowing, I do not

see that they are like to shed any important light upon the subject before us. Every such instance requires a good deal of circumstantial explanation before it can be accepted. It is not enough that a practitioner should have had a single case of puerperal fever not followed by others. It must be known whether he attended others while this case was in progress, whether he went directly from one chamber to others, whether he took any, and what precautions. It is important to know that several women were exposed to infection derived from the patient, so that allowance may be made for want of predisposition. Now if of negative facts so sifted there could be accumulated a hundred for every one plain instance of communication here recorded, I trust it need not be said that we are bound to guard and watch over the hundredth tenant of our fold, though the ninety and nine may be sure of escaping the wolf at its entrance. If any one is disposed, then, to take a hundred instances of lives endangered or sacrificed out of those I have mentioned, and make it reasonably clear that within a similar time and compass *ten thousand* escaped the same exposure, I shall thank him for his industry, but I must be permitted to hold to my own practical conclusions, and beg him to adopt or at least to examine them also. Children that walk in calico before open fires are not always burned to death; the instances to the contrary may be worth recording; but by no means if they are to be used as arguments against woollen frocks and high fenders.

I am not sure that this paper will escape another remark which it might be wished were founded in justice. It may be said that the facts are too generally known and acknowledged to require any formal argument or exposition, that there is nothing new in the positions advanced, and no need of laying additional statements before the profession. But on turning to two works, one almost universally, and the other extensively appealed to as authority in this country, I see ample reason to overlook this objection. In the last edition of Dewees's Treatise on the Diseases of Females, it is expressly said, "In this country, under no circumstance that puerperal fever has appeared hitherto, does it afford the slightest ground for the belief that it is contagious." In the "Philadelphia Practice of Midwifery" not one word can be found in the chapter devoted to this disease, which would lead the reader to suspect that the idea of contagion had ever been entertained. It seems proper, therefore, to remind those who are in the habit of referring to these works for guidance, that there may possibly be some sources of danger they have slight-

ed or omitted, quite as important as a trifling irregularity of diet, or a confined state of the bowels, and that whatever confidence a physician may have in his own mode of treatment, his services are of questionable value whenever he carries the bane as well as the antidote about his person.

The practical point to be illustrated is the following: ***The disease known as Puerperal Fever is so far contagious as to be frequently carried from patient to patient by physicians and nurses.***

Let me begin by throwing out certain incidental questions, which without being absolutely essential, would render the subject more complicated, and by making such concessions and assumptions as may be fairly supposed to be without the pale of discussion.

1. It is granted that all the forms of what is called puerperal fever may not be, and probably are not, equally contagious or infectious. I do not enter into the distinctions that have been drawn by authors, because the facts do not appear to me sufficient to establish any absolute line of demarcation between such forms as may be propagated by contagion, and those which are never so propagated. This general result I shall only support by the authority of Dr. Ramsbotham, who gives as the result of his experience, that the same symptoms belong to what he calls the infectious and the sporadic forms of the disease, and the opinion of Armstrong in his original essay. If others can show any such distinction, I leave it to them to do it. But there are cases enough that show the prevalence of the disease among the patients of a single practitioner when the disease was in no degree epidemic, in the proper sense of the term. I may refer to those of Mr. Roberton and of Dr. Pearson, hereafter to be cited, as examples.

2. I shall not enter into any dispute about the particular ***mode*** of infection, whether it be by the atmosphere the physician carries about him into the sick chamber, or by the direct application of the virus to the absorbing surfaces with which his hand comes in contact. Many facts and opinions are in favor of each of these modes of transmission. But it is obvious that in the majority of cases it must be impossible to decide by which of these channels the disease is conveyed, from the nature of the intercourse between the physician and the patient.

3. It is not pretended that the contagion of puerperal fever must always be followed by the disease. It is true of all contagious diseases that they frequently spare those who appear to be fully submitted to their influence. Even the vaccine virus, fresh from the

subject, fails every day to produce its legitimate effect, though every precaution is taken to ensure its action. This is still more remarkably the case with scarlet fever and some other diseases.

4. It is granted that the disease may be produced and variously modified by many causes besides contagion, and more especially by epidemic and endemic influences. But this is not peculiar to the disease in question. There is no doubt that smallpox is propagated to a great extent by contagion, yet it goes through the same periods of periodical increase and diminution which have been remarked in puerperal fever. If the question is asked how we are to reconcile the great variations in the mortality of puerperal fever in different seasons and places with the supposition of contagion, I will answer it by another question from Mr. Farr's letter to the Registrar-General. He makes the statement that "*five* die weekly of smallpox in the metropolis when the disease is not epidemic"—and adds, "The problem for solution is,—Why do the 5 deaths become 10, 15, 20, 31, 58, 88 weekly, and then progressively fall through the same measured steps?"

5. I take it for granted that if it can be shown that great numbers of lives have been and are sacrificed to ignorance or blindness on this point, no other error of which physicians or nurses may be occasionally suspected will be alleged in palliation of this; but that whenever and wherever they can be shown to carry disease and death instead of health and safety, the common instincts of humanity will silence every attempt to explain away their responsibility.

The treatise of Dr. Gordon, of Aberdeen, was published in the year 1795, being among the earlier special works upon the disease. A part of his testimony has been occasionally copied into other works, but his expressions are so clear, his experience is given with such manly distinctness and disinterested honesty, that it may be quoted as a model which might have been often followed with advantage.

"This disease seized such women only as were visited, or delivered, by a practitioner, or taken care of by a nurse, who had previously attended patients affected with the disease."

"I had evident proofs of its infectious nature, and that the infection was as readily communicated as that of the small-pox or measles, and operated more speedily than any other infection with which I am acquainted."

"I had evident proofs that every person who had been with a pa-

tient in the puerperal fever became charged with an atmosphere of infection, which was communicated to every pregnant woman who happened to come within its sphere. This is not an assertion, but a fact, admitting of demonstration, as may be seen by a perusal of the foregoing table,"—referring to a table of seventy-seven cases, in many of which the channel of propagation was evident.

He adds, "It is a disagreeable declaration for me to mention, that I myself was the means of carrying the infection to a great number of women." He then enumerates a number of instances in which the disease was conveyed by midwives and others to the neighboring villages, and declares that "These facts fully prove, that the cause of the puerperal fever, of which I treat, was a specific contagion, or infection, altogether unconnected with a noxious constitution of the atmosphere."

But his most terrible evidence is given in these words, "I ARRIVED AT THAT CERTAINTY IN THE MATTER, THAT I COULD VENTURE TO FORETELL WHAT WOMAN WOULD BE AFFECTED WITH THE DISEASE, UPON HEARING BY WHAT MIDWIFE THEY WERE TO BE DELIVERED, OR BY WHAT NURSE THEY WERE TO BE ATTENDED, DURING THEIR LYING IN: AND, ALMOST IN EVERY INSTANCE, MY PREDICTION WAS VERIFIED."

Even previously to Gordon, Mr. White of Manchester had said, "I am acquainted with two gentlemen in another town, where the whole business of midwifery is divided betwixt them, and it is very remarkable that one of them loses several patients every year of the puerperal fever, and the other never so much as meets with the disorder"—a difference which he seems to attribute to their various modes of treatment.*

Dr. Armstrong has given a number of instances in his Essay on Puerperal Fever, of the prevalence of the disease among the patients of a single practitioner. At Sunderland, "in all, forty-three cases occurred from the first of January to the first of October, when the disease ceased; and of this number forty were witnessed by Mr. Gregson and his assistant Mr. Gregory, the remainder having been separately seen by three accoucheurs." There is appended to the London edition of this essay, a letter from Mr. Gregson, in which that gentleman says, in reference to the great number of cases occurring in his practice, "The cause of this I cannot pretend fully to explain, but I should be wanting in common liberality if I were to

* On the Management of Lying-in Women, p. 120.

make any hesitation in asserting, that the disease which appeared in my practice was highly contagious, and communicable from one puerperal woman to another." "It is customary among the lower and middle ranks of people to make frequent personal visits to puerperal women resident in the same neighborhood, and I have ample evidence for affirming that the infection of the disease was often carried about in that manner; and, however painful to my feelings, I must in candor declare, that it is very probable the contagion was conveyed, in some instances, by myself, though I took every possible care to prevent such a thing from happening, the moment that I ascertained that the distemper was infectious." Dr. Armstrong goes on to mention six other instances within his knowledge, in which the disease had at different times and places been limited, in the same singular manner, to the practice of individuals, while it existed scarcely if at all among the patients of others around them. Two of the gentlemen became so convinced of their conveying the contagion that they withdrew for a time from practice.

I find a brief notice, in an American Journal, of another series of cases, first mentioned by Mr. Davies, in the Medical Repository. This gentleman stated his conviction that the disease is contagious. "In the autumn of 1822, he met with twelve cases, while his medical friends in the neighborhood did not meet with any, 'or at least very few.' He could attribute this circumstance to no other cause than his having been present at the examination, after death, of two cases, sometime previous, and of his having imparted the disease to his patients, notwithstanding every precaution." *

Dr. Gooch says, "It is not uncommon for the greater number of cases to occur in the practice of one man, whilst the other practitioners of the neighborhood, who are not more skilful or more busy, meet with few or none. A practitioner opened the body of a woman who had died of puerperal fever, and continued to wear the same clothes. A lady whom he delivered a few days afterwards was attacked with and died of a similar disease; two more of his lying-in patients, in rapid succession, met with the same fate; struck by the thought, that he might have carried contagion in his clothes, he instantly changed them, and met with no more cases of the kind.† A woman in the country, who was employed as washerwoman and

* Philad. Med. Journal for 1825, p. 408.

† A similar anecdote is related by Sir Benjamin Brodie, of the late Dr. John Clarke. Lancet, May 2, 1840.

nurse, washed the linen of one who had died of puerperal fever; the next lying-in patient she nursed, died of the same disease; a third nursed by her met with the same fate, till the neighborhood getting afraid of her, ceased to employ her." *

In the winter of the year 1824 "Several instances occurred of its prevalence among the patients of particular practitioners, whilst others who were equally busy met with few or none. One instance of this kind was very remarkable. A general practitioner, in large midwifery practice, lost so many patients from puerperal fever, that he determined to deliver no more for some time, but that his partner should attend in his place. This plan was pursued for one month, during which not a case of the disease occurred in their practice. The elder practitioner being then sufficiently recovered, returned to his practice, but the first patient he attended was attacked by the disease and died. A physician, who met him in consultation soon afterwards, about a case of a different kind, and who knew nothing of his misfortune, asked him whether puerperal fever was at all prevalent in his neighborhood, on which he burst into tears, and related the above circumstances.

"Among the cases which I saw this season in consultation, four occurred in one month in the practice of one medical man, and all of them terminated fatally." †

Dr. Ramsbotham asserted, in a lecture at the London Hospital, that he had known the disease spread through a particular district, or be confined to the practice of a particular person, almost every patient being attacked with it, while others had not a single case. It seemed capable, he thought, of conveyance, not only by common modes, but through the dress of the attendants upon the patient.‡

In a letter to be found in the London Medical Gazette for Jan., 1840, Mr. Roberton, of Manchester, makes the statement which I here give in a somewhat condensed form.

A midwife delivered a woman on the 4th of December, 1830, who died soon after with the symptoms of puerperal fever. In one month from this date the same midwife delivered thirty women, residing in different parts of an extensive suburb, of which number sixteen caught the disease and all died. These were the only cases which had occurred for a considerable time in Manchester. The other

* An Account of some of the most important Diseases peculiar to Women, p. 4. † Ib. p. 71.
‡ Lond. Med. Gaz. May 2, 1835.

midwives connected with the same charitable institution as the woman already mentioned, are twenty-five in number, and deliver, on an average, ninety women a week, or about three hundred and eighty a month. None of these women had a case of puerperal fever. "Yet all this time this woman was crossing the other midwives in every direction, scores of the patients of the charity being delivered by them in the very same quarters where her cases of fever were happening."

Mr. Roberton remarks, that little more than half the women she delivered during this month took the fever; that on some days all escaped, on others only one or more out of three or four; a circumstance similar to what is seen in other infectious maladies.

Dr. Blundell says, "Those who have never made the experiment, can have but a faint conception how difficult it is to obtain the exact truth respecting any occurrence in which feelings and interests are concerned. Omitting particulars, then, I content myself with remarking, generally, that from more than one district I have received accounts of the prevalence of puerperal fever in the practice of some individuals, while its occurrence in that of others, in the same neighborhood, was not observed. Some, as I have been told, have lost ten, twelve, or a greater number of patients, in scarcely broken succession; like their evil genius, the puerperal fever has seemed to stalk behind them wherever they went. Some have deemed it prudent to retire for a time from practice. In fine, that this fever may occur spontaneously, I admit; that its infectious nature may be plausibly disputed, I do not deny; but I add, considerately, that in my own family, I had rather that those I esteemed the most should be delivered, unaided, in a stable, by the manger-side, than that they should receive the best help, in the fairest apartment, but exposed to the vapors of this pitiless disease. Gossiping friends, wet nurses, monthly nurses, the practitioner himself, these are the channels by which, as I suspect, the infection is principally conveyed." *

At a meeting of the Royal Medical and Chirurgical Society, Dr. King mentioned that some years since a practitioner at Woolwich lost sixteen patients from puerperal fever in the same year. He was compelled to give up practice for one or two years, his business being divided among the neighboring practitioners. No case of puerperal fever occurred afterwards, neither had any of the neighboring surgeons any cases of this disease.

* Lect. on Midwifery, p. 395.

At the same meeting Mr. Hutchinson mentioned the occurrence of three consecutive cases of puerperal fever, followed subsequently by two others, all in the practice of one accoucheur.*

Dr. Lee makes the following statement. "In the last two weeks of September, 1827, five fatal cases of uterine inflammation came under our observation. All the individuals so attacked had been attended in labor by the same midwife, and no example of a febrile or inflammatory disease of a serious nature occurred during that period among the other patients of the Westminster General Dispensary, who had been attended by the other midwives belonging to that institution." †

The recurrence of long series of cases like those I have cited, reported by those most interested to disbelieve in contagion, scattered along through an interval of half a century, might have been thought sufficient to satisfy the minds of all inquirers that here was something more than a singular coincidence. But if on a more extended observation, it should be found that the same ominous groups of cases, clustering about individual practitioners, were observed in a remote country, at different times, and in widely separated regions, it would seem incredible that any should be found too prejudiced or indolent to accept the solemn truth knelled into their ears by the funeral bells from both sides of the ocean—the plain conclusion that the physician and the disease entered, hand in hand, into the chamber of the unsuspecting patient.

That such series of cases have been observed in this country, and in this neighborhood, I proceed to show.

In Dr. Francis's Notes to Denman's Midwifery, a passage is cited from Dr. Hosack, in which he refers to certain puerperal cases which proved fatal to several lying-in women, and in some of which the disease was supposed to be conveyed by the accoucheurs themselves.‡

A writer in the N. Y. Medical and Physical Journal for October, 1829, in speaking of the occurrence of puerperal fever, confined to one man's practice, remarks, "We have known cases of this kind occur, though rarely, in New York."

I mention these little hints about the occurrence of such cases, partly because they are the first I have met with in American medical literature, but more especially because they serve to remind us that behind the fearful array of published facts, there lies a dark list

* Lancet, May 2, 1840.

† Lond. Cyc. of Pract. Med., Art. Fever, Puerperal.

‡ Denman's Midwifery, p. 675, 3d Am. Ed.

of similar events, unwritten in the records of science, but long remembered by many a desolated fireside.

Certainly nothing can be more open and explicit than the account given by Dr. Peirson, of Salem. of the cases seen by him. In the first nineteen days of January, 1829, he had five consecutive cases of puerperal fever, every patient he attended being attacked, and the three first cases proving fatal. In March, of the same year, he had two moderate cases; in June, another case, and in July, another, which proved fatal. "Up to this period," he remarks, "I am not informed that a single case had occurred in the practice of any other physician. Since that period I have had no fatal case in my practice, although I have had several dangerous cases. I have attended in all twenty cases of this disease, of which four have been fatal. I am not aware that there has been any other case in the town of distinct puerperal peritonitis, although I am willing to admit my information may be very defective on this point. I have been told of some "mixed cases," and "morbid affections after delivery." *

In the Quarterly Summary of the Transactions of the College of Physicians of Philadelphia,† may be found some most extraordinary developments respecting a series of cases occurring in the practice of a member of that body.

Dr. Condie called the attention of the Society to the prevalence at the present time, of puerperal fever of a peculiarly insidious and malignant character. "In the practice of one gentleman extensively engaged as an obstetrician, nearly every female he has attended in confinement, during several weeks past, within the above limits," (the southern sections and neighboring districts) "had been attacked by the fever."

"An important query presents itself, the Doctor observed, in reference to the particular form of fever now prevalent. Is it, namely, capable of being propagated by contagion, and is a physician who has been in attendance upon a case of the disease, warranted in continuing, without interruption, his practice as an obstetrician? Dr. C., although not a believer in the contagious character of many of those affections generally supposed to be propagated in this manner, has nevertheless become convinced by the facts that have fallen under his notice, that the puerperal fever now prevailing, is capable of being communicated by contagion. How otherwise can be explained the very curious circumstance of the disease in one district being ex-

* Remarks on Puerperal Fever, pp. 12 and 13. † For May, June, and July, 1842.

clusively confined to the practice of a single physician, a Fellow of this College, extensively engaged in obstetrical practice—while no instance of the disease has occurred in the patients under the care of any other accoucheur practising within the same district; scarcely a female that has been delivered for weeks past has escaped an attack?"

Dr. Rutter, the practitioner referred to, "observed that after the occurrence of a number of cases of the disease in his practice, he had left the city and remained absent for a week, but on returning, no article of clothing he then wore having been used by him before, one of the very first cases of parturition he attended was followed by an attack of the fever, and terminated fatally; he cannot, readily, therefore, believe in the transmission of the disease from female to female, in the person or clothes of the physician."

The meeting at which these remarks were made was held on the third of May, 1842. In a letter dated December 20, 1842, addressed to Dr. Meigs, and to be found in the Medical Examiner,* he speaks of "those horrible cases of puerperal fever, some of which you did me the favor to see with me during the past summer," and talks of his experience in the disease, "now numbering nearly 70 cases, all of which have occurred within less than a twelvemonth past."

And Dr. Meigs asserts, on the same page, "Indeed, I believe that his practice in that department of the profession, was greater than that of any other gentlemen, which was probably the cause of his seeing a greater number of the cases." This from a professor of midwifery, who some time ago assured a gentleman whom he met in consultation, that the night on which they met was the eighteenth in succession that he himself had been summoned from his repose,† seems hardly satisfactory.

I must call the attention of the inquirer most particularly to the Quarterly Report above referred to, and the letters of Dr. Meigs and Dr. Rutter, to be found in the Medical Examiner. Whatever impression they may produce upon his mind, I trust they will at least convince him that there is some reason for looking into this apparently uninviting subject.

At the meeting of the College of Physicians just mentioned, Dr. Warrington stated that a few days after assisting at an autopsy of puerperal peritonitis, in which he laded out the contents of the abdominal cavity with his hands, he was called upon to deliver three

* For Jan. 21, 1843. † Med. Examiner for Dec. 10, 1842.

women in rapid succession. All of these women were attacked with different forms of what is commonly called puerperal fever. Soon after these he saw two other patients, both on the same day, with the same disease. Of these five patients two died.

At the same meeting, Dr. West mentioned a fact related to him by Dr. Samuel Jackson, of Northumberland. Seven females, delivered by Dr. Jackson in rapid succession, while practising in Northumberland county, were all attacked with puerperal fever, and five of them died. "Women," he said, "who had expected me to attend upon them, now becoming alarmed, removed out of my reach, and others sent for a physician residing several miles distant. These women, as well as those attended by midwives, all did well; nor did we hear of any deaths in childbed within a radius of fifty miles, excepting two, and these I afterwards ascertained to have been caused by other diseases." He underwent, as he thought, a thorough purification, and still his next patient was attacked with the disease and died. He was led to suspect that the contagion might have been carried in the gloves which he had worn in attendance upon the previous cases. Two months or more after this he had two other cases. He could find nothing to account for these, unless it were the instruments for giving enemata which had been used in two of the former cases, and were employed by these patients. When the first case occurred, he was attending and dressing a limb extensively mortified from erysipelas, and went immediately to the accouchement with his clothes and gloves most thoroughly imbued with its effluvia. And here I may mention, that this very Dr. Samuel Jackson, of Northumberland, is one of Dr. Dewees's authorities against contagion.

The three following statements are now for the first time given to the public. All of the cases referred to occurred within this State, and two of the three series in Boston and its immediate vicinity.

I. The first is a series of cases which took place during the last spring in a town at some distance from this neighborhood. A physician of that town, Dr. C., had the following consecutive cases.

No. 1, delivered March 20, died March 24.
2, " April 9, " April 14.
3, " 10, " " 14.
4, " 11, " " 18.
5, " 27, " May 3.
6, " 28, Had some symptoms, recovered.
7, " May 8, Had some symptoms, also recovered.

These were the only cases attended by this physician during the period referred to. "They were all attended by him until their termination, with the exception of the patient No. 6, who fell into the hands of another physician on the 2d of May. (Dr. C. left town for a few days at this time.) Dr. C. attended cases immediately before and after the above-named periods, none of which, however, presented any peculiar symptoms of the disease."

About the first of July, he attended another patient in a neighboring village, who died two or three days after delivery.

The first patient, it is stated, was delivered on the 20th of March. "On the 19th, Dr. C. made the autopsy of a man who died suddenly, sick only 48 hours; had œdema of the thigh, and gangrene extending from a little above the ankle into the cavity of the abdomen." Dr. C. wounded himself, very slightly, in the right hand during the autopsy. The hand was quite painful the night following, during his attendance on the patient No. 1. He did not see this patient after the 20th, being confined to the house, and very sick from the wound just mentioned, from this time until the third of April.

Several cases of erysipelas occurred in the house where the autopsy mentioned above took place, soon after the examination. There were also many cases of erysipelas in town at the time of the fatal puerperal cases which have been mentioned.

The nurse who laid out the body of the patient No. 3, was taken on the evening of the same day with sore throat and erysipelas, and died in ten days from the first attack.

The nurse who laid out the body of the patient No. 4, was taken on the day following with symptoms like those of this patient, and died in a week, without any external marks of erysipelas.

"No other cases of similar character with those of Dr. C. occurred in the practice of any of the physicians in the town or vicinity at the time. Deaths following confinement have occurred in the practice of other physicians during the past year, but they were not cases of puerperal fever. No post-mortem examinations were held in any of these puerperal cases."

Some additional statements in this letter are deserving of insertion.

"A physician attended a woman in the immediate neighborhood of the cases numbered 2, 3 and 4. This patient was confined the morning of March 1st, and died on the night of March 7th. It is doubtful whether this should be considered a case of puerperal fever. She had suffered from canker, indigestion and diarrhœa for a year previous to her delivery. Her complaints were much aggravated for

two or three months previous to delivery; she had become greatly emaciated, and weakened to such an extent, that it had not been expected that she would long survive her confinement, if indeed she reached that period. Her labor was easy enough; she flowed a good deal, seemed exceedingly prostrated, had ringing in the ears, and other symptoms of exhaustion; the pulse was quick and small. On the second and third day there was some tenderness and tumefaction of the abdomen, which increased somewhat on the fourth and fifth. He had cases in midwifery before and after this, which presented nothing peculiar."

It is also mentioned in the same letter, that another physician had a case which happened last summer and another last fall, both of which recovered.

Another gentleman reports a case last December, a second case five weeks and another three weeks since. All these recovered. A case also occurred very recently in the practice of a physician in the village where the eighth patient of Dr. C. resides, which proved fatal. "This patient had some patches of erysipelas on the legs and arms. The same physician has delivered three cases since, which have all done well. There have been no other cases in this town or its vicinity recently. There have been some few cases of erysipelas." It deserves notice that the partner of Dr. C., who attended the autopsy of the man above-mentioned and took an active part in it; who also suffered very slightly from a prick under the thumb nail received during the examination, had twelve cases of midwifery between March 26th and April 12th, all of which did well, and presented no peculiar symptoms. It should also be stated, that during these 17 days he was in attendance on all the cases of erysipelas in the house where the autopsy had been performed.

I owe these facts to the prompt kindness of a gentleman whose intelligence and character are sufficient guaranty for their accuracy.

The two following letters were addressed to my friend Dr. Storer, by the gentlemen in whose practice the cases of puerperal fever occurred. His name renders it unnecessary to refer more particularly to these gentlemen, who on their part have manifested the most perfect freedom and courtesy in affording these accounts of their painful experience.

JAN. 28, 1843.

II. **** "The time to which you allude was in 1830. The first case was in February, during a very cold time. She was confined

the 4th and died the 12th. Between the 10th and 28th of this month, I attended six women in labor, all of whom did well except the last, as also two who were confined March 1st and 5th. Mrs. E., confined Feb. 28th, sickened, and died March 8th. The next day, 9th, I inspected the body, and the night after attended a lady, Mrs. B., who sickened, and died 16th. The 10th, I attended another, Mrs. G., who sickened, but recovered. March 16th, I went from Mrs. G.'s room to attend a Mrs. H., who sickened, and died 21st. The 17th, I inspected Mrs. B. On 19th, I went directly from Mrs. H.'s room to attend another lady, Mrs. G., who also sickened, and died 22d. While Mrs. B. was sick, on 15th, I went directly from her room a few rods, and attended another woman, who was not sick. Up to 20th of this month I wore the same clothes. I now refused to attend any labor, and did not till April 21st, when having thoroughly cleansed myself, I resumed my practice, and had no more puerperal fever.

"The cases were not confined to a narrow space. The two nearest were half a mile from each other, and half that distance from my residence. The others were from two to three miles apart, and nearly that distance from my residence. There were no other cases in their immediate vicinity which came to my knowledge. The general health of all the women, was pretty good, and all the labors as good as common except the first. This woman, in consequence of my not arriving in season, and the child being half born some time before I arrived, was very much exposed to the cold at the time of confinement, and afterwards, being confined in a very open cold room. Of the six cases you perceive only one recovered.

"In the winter of 1817 two of my patients had puerperal fever, one very badly, the other not so badly. Both recovered. One other had swelled leg, or phlegmasia dolens, and one or two others did not recover as well as usual.

"In the summer of 1835 another disastrous period occurred in my practice. July 1st, I attended a lady in labor, who was afterwards quite ill and feverish; but at the time I did not consider her case a decided puerperal fever. On 8th, I attended one who did well. On 12th, one who was seriously sick. This was also an equivocal case, apparently arising from constipation and irritation of the rectum. These women were ten miles apart and five from my residence. On 15th and 20th, two who did well. On 25th, I attended another. This was a severe labor, and followed by unequivocal puerperal

fever, or peritonitis. She recovered. August 2d and 3d, in about twenty-four hours I attended four persons. Two of them did very well; one was attacked with some of the common symptoms, which however subsided in a day or two, and the other had decided puerperal fever, but recovered. This woman resided five miles from me. Up to this time I wore the same coat. All my other clothes had frequently been changed. On 6th, I attended two women, one of whom was not sick at all; but the other, Mrs. L., was afterwards taken ill. On 10th, I attended a lady, who did very well. I had previously changed all my clothes, and had no garment on which had been in a puerperal room. On 12th, I was called to Mrs. S., in labor. While she was ill, I left her to visit Mrs. L., one of the ladies who was confined on 6th. Mrs. L. had been more unwell than usual, but I had not considered her case any thing more than common till this visit. I had on a surtout at this visit, which on my return to Mrs. S., I left in another room. Mrs. S. was delivered on 13th with forceps. These women both died of decided puerperal fever.

"While I attended these women in their fevers, I changed my clothes, and washed my hands in a solution of chloride of lime after each visit. I attended seven women in labor during this period, all of whom recovered without sickness.

"In my practice I have had several single cases of puerperal fever, some of whom have died and some have recovered. Until the year 1830, I had no suspicion that the disease could be communicated from one patient to another by a nurse or midwife; but I now think the foregoing facts strongly favor that idea. I was so much convinced of this fact, that I adopted the plan before related.

"I believe my own health was as good as usual at each of the above periods. I have no recollection to the contrary.

"I believe I have answered all your questions. I have been more particular on some points perhaps than necessary; but I thought you could form your own opinion better than to take mine. In 1830, I wrote to Dr. Channing a more particular statement of my cases. If I have not answered your questions sufficiently, perhaps Dr. C. may have my letter to him, and you can find your answer there." *

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* In a letter to myself, this gentleman also stated, "I do not recollect that there was any erysipelas or any other disease particularly prevalent at the time."

Boston, Feb. 3, 1843.

III. "My Dear Sir,—I received a note from you last evening, requesting me to answer certain questions therein proposed, touching the cases of puerperal fever which came under my observation the past summer. It gives me pleasure to comply with your request, so far as it is in my power so to do, but owing to the hurry in preparing for a journey, the notes of the cases I had then taken, were lost or mislaid. The principal *facts*, however, are too vivid upon my recollection to be soon forgotten. I think, therefore, that I shall be able to give you all the information you may require.

"All the cases that occurred in my practice, took place between the 7th of May and the 17th of June, 1842.

"They were not confined to any particular part of the city. The two first cases were patients residing at the south-end, the next was at the extreme north-end, one living in Sea street and the other in Roxbury. The following is the order in which they occurred.

"Case 1. Mrs. —— was confined on the 7th of May, at 5 o'clock, P. M., after a natural labor of six hours. At 12 o'clock at night, on the 9th (thirty-one hours after confinement), she was taken with severe chill, previous to which she was as comfortable as women usually are under the circumstances. She died on the 10th.

"Case 2. Mrs. —— was confined on the 10th of June (four weeks after Mrs. C.), at 11, A. M., after a natural, but somewhat severe labor of 5 hours. At 7 o'clock, on the morning of the 11th, she had a chill. Died on the 12th.

"Case 3. Mrs. ——, confined on the 14th of June, was comfortable until the 18th, when symptoms of puerperal fever were manifest. She died on the 20th.

"Case 4. Mrs. ——, confined June 17th, at 5 o'clock, A. M., was doing well until the morning of the 19th. She died on the evening of the 21st.

"Case 5. Mrs. —— was confined with her *fifth* child on the 17th of June, at 6 o'clock in the evening. This patient had been attacked with puerperal fever, at three of her previous confinements, but the disease yielded to depletion and other remedies without difficulty. This time, I regret to say, I was not so fortunate. She was not attacked, as were the other patients, with a chill, but complained of extreme pain in abdomen, and tenderness on pressure, almost from the moment of her confinement. In this, as in the other cases, the disease resisted all remedies, and she died in great distress

on the 22d of the same month. Owing to the extreme heat of the season, and my own indisposition, none of the subjects were examined after death. Dr. Channing, who was in attendance with me on the three last cases, proposed to have a post-mortem examination of the subject of case No. 5, but from some cause which I do not now recollect, it was not obtained.

"You wish to know whether I wore the same clothes when attending the different cases. I cannot positively say, but I should think I did not, as the weather became warmer after the first two cases; I therefore think it probable that I made a change of at least a *part* of my dress. I have had no other case of puerperal fever in my own practice for three years, save those above related, and I do not remember to have lost a patient before with this disease. While absent, last July, I visited two patients sick with puerperal fever, with a friend of mine in the country. Both of them recovered.

"The cases that I have recorded, were not confined to any particular constitution or temperament, but it seized upon the strong and the weak, the old and the young—one being over 40 years, and youngest under 18 years of age.***** If the disease is of an erysipelatous nature, as many suppose, contagionists may perhaps find some ground for their belief in the fact that for two weeks previous to my first case of puerperal fever, I had been attending a severe case of erysipelas, and the infection may have been conveyed through me to the patient; but on the other hand, why is not this the case with other physicians, or with the same physician at all times, for since my return from the country I have had a more inveterate case of erysipelas than ever before, and no difficulty whatever has attended any of my midwifery cases."

I am assured, on unquestionable authority, that "About three years since, a gentleman in extensive midwifery business, in a neighboring State, lost in the course of a few weeks eight patients in child-bed, seven of them being undoubted cases of puerperal fever. No other physician of the town lost a single patient of this disease during the same period." And from what I have heard in conversation with some of our most experienced practitioners, I am inclined to think many cases of the kind might be brought to light by extensive inquiry.

This long catalogue of melancholy histories assumes a still darker aspect when we remember how kindly nature deals with the par-

turient female, when she is not immersed in the virulent atmosphere of an impure lying-in hospital, or poisoned in her chamber by the unsuspected breath of contagion. From all causes together, not more than four deaths in a thousand births and miscarriages, happened in England and Wales during the period embraced by the first Report of the Registrar-General.* In the second Report the mortality was shown to be about five in one thousand.† In the Dublin Lying-in Hospital, during the seven years of Dr. Collins's mastership, there was one case of puerperal fever to 178 deliveries, or less than six to the thousand, and one death from this disease in 278 cases, or between three and four to the thousand.‡ Yet during this period the disease was endemic in the hospital, and might have gone on to rival the horrors of the pestilence of the Maternité, had not the poison been destroyed by a thorough purification.

In private practice, leaving out of view the cases that are to be ascribed to the self-acting system of propagation, it would seem that the disease must be far from common. Mr. White, of Manchester, says, "Out of the whole number of lying-in patients whom I have delivered (and I may safely call it a great one), I have never lost one, nor to the best of my recollection has one been greatly endangered, by the puerperal, miliary, low nervous, putrid malignant, or milk fever." § Dr. Joseph Clarke informed Dr. Collins, that in the course of *forty-five* years' most extensive practice, he lost but *four* patients from this disease.‖ One of the most eminent practitioners of Glasgow, who has been engaged in very extensive practice for upwards of a quarter of a century, testifies that he never saw more than twelve cases of real puerperal fever.¶

I have myself been told by two gentlemen practising in this city, and having for many years a large midwifery business, that they had neither of them lost a patient from this disease, and by one of them that he had only seen it in consultation with other physicians. In five hundred cases of midwifery of which Dr. Storer has given an abstract in the first number of this Journal, there was only one instance of fatal puerperal peritonitis.

In the view of these facts, it does appear a singular coincidence, that one man or woman should have ten, twenty, thirty, or seventy cases of this rare disease, following their footsteps with the keenness

* 1st Report, p. 105. † 2d Report, p. 73. ‡ Collins's Midwifery, p. 228, etc. § Op. cit. p. 115. ‖ Collins's Treatise on Midwifery, p. 228. ¶ Lancet, May 4, 1838.

of a beagle, through the streets and lanes of a crowded city, while the scores that cross the same paths on the same errands know it only by name. It is a series of similar coincidences that has led us to consider the dagger, the musket, and certain innocent looking white powders, as having some little claim to be regarded as dangerous. It is the practical inattention to similar coincidences that has given rise to the unpleasant but often necessary documents called *indictments*, that has sharpened a form of the cephalotome sometimes employed in the case of adults, and adjusted that modification of the fillet which delivers the world of those who happen to be too much in the way while such striking coincidences are taking place.

I shall now mention a few instances in which the disease appears to have been conveyed by the process of direct inoculation.

Dr. Campbell, of Edinburgh, states that in October, 1821, he assisted at the post-mortem examination of a patient who died with puerperal fever. He carried the pelvic viscera in his pocket to the class room. The same evening he attended a woman in labor without previously changing his clothes; this patient died. The next morning he delivered a woman with the forceps; she died also, and of many others who were seized with the disease within a few weeks, three shared the same fate in succession.

In June, 1823, he assisted some of his pupils at the autopsy of a case of puerperal fever. He was unable to wash his hands with proper care, for want of the necessary accommodations. On getting home he found two patients required his assistance. He went without further ablution, or changing his clothes; both these patients died with puerperal fever.* This same Dr. Campbell is one of Dr. Churchill's authorities against contagion.

Mr. Roberton says that in one instance within his knowledge, a practitioner passed the catheter for a patient with puerperal fever late in the evening; the same night he attended a lady who had the symptoms of the disease on the second day. In another instance a surgeon was called while in the act of inspecting the body of a woman who had died of this fever, to attend a labor; within forty-eight hours this patient was seized with the fever.†

On the 16th of March, 1831, a medical practitioner examined the body of a woman who had died a few days after delivery, from puerperal peritonitis. On the evening of the 17th he delivered a patient who was seized with puerperal fever on the 19th, and died on the

* London Med. Gaz. Dec. 10th, 1831.

† Ibid. for Jan. 1832.

24th. Between this period and the 6th of April, the same practitioner attended two other patients, both of whom were attacked with the same disease and died.*

In the autumn of 1829, a physician was present at the examination of a case of puerperal fever, dissected out the organs, and assisted in sewing up the body. He had scarcely reached home when he was summoned to attend a young lady in labor. In sixteen hours she was attacked with the symptoms of puerperal fever, and narrowly escaped with her life.†

In December, 1830, a midwife who had attended two fatal cases of puerperal fever at the British Lying-in Hospital, examined a patient who had just been admitted, to ascertain if labor had commenced. This patient remained two days in the expectation that labor would come on, when she returned home and was then suddenly taken in labor, and delivered before she could set out for the hospital. She went on favorably for two days, and was then taken with puerperal fever and died in thirty-six hours.‡

"A young practitioner, contrary to advice, examined the body of a patient who had died from puerperal fever; there was no epidemic at the time; the case appeared to be purely sporadic. He delivered three other women shortly afterwards; they all died with puerperal fever, the symptoms of which broke out very soon after labor. The patients of his colleague did well, except one, where he assisted to remove some coagula from the uterus; she was attacked in the same manner as those whom he had attended, and died also." The writer in the British and Foreign Medical Review, from whom I quote this statement—and who is no other than Dr. Rigby—adds, "we trust that this fact alone will forever silence such doubts, and stamp the well-merited epithet of 'criminal,' as above quoted, upon such attempts."§

From the cases given by Mr. Ingleby, I select the following. Two gentlemen, after having been engaged in conducting the post-mortem examination of a case of puerperal fever, went in the same dress, each respectively, to a case of midwifery. "The one patient was seized with the rigor about thirty hours afterwards. The other patient was seized with a rigor the third morning after delivery. *One recovered, one died.*"‖ One of these same gentlemen attended another woman

* London Cyc. of Pract. Med., Art. Fever, Puerperal.
† Ibid.
‡ Ibid.
§ Brit. and For. Medical Review, for Jan. 1842, p. 112.
‖ Edin. Med. and Surg. Journal, April, 1838.

in the same clothes two days after the autopsy referred to. "The rigor did not take place until the evening of the fifth day from the first visit. ***Result fatal.***" These cases belonged to a series of seven, the first of which was thought to have originated in a case of erysipelas. "Several cases of a mild character followed the foregoing seven, and their nature being now most unequivocal, my friend declined visiting all midwifery cases for a time; and there was no recurrence of the disease." These cases occurred in 1833. Five of them proved fatal. Mr. Ingleby gives another series of seven cases which occurred to a practitioner in 1836, the first of which was also attributed to his having opened several erysipelatous abscesses a short time previously.

I need not refer to the case lately read before this Society, in which a physician went, soon after performing an autopsy of a case of puerperal fever, to a woman in labor, who was seized with the same disease and perished. The forfeit of that error has been already paid.

At the meeting of the Medical and Chirurgical Society before referred to, Dr. Merriman related an instance occurring in his own practice, which excites a reasonable suspicion that two lives were sacrificed to a still less dangerous experiment. He was at the examination of a case of puerperal fever at 2 o'clock in the afternoon. ***He took care not to touch the body.*** At 9 o'clock the same evening he attended a woman in labor; she was so nearly delivered that he had scarcely any thing to do. The next morning she had severe rigors, and in 48 hours was a corpse. Her infant had erysipelas and died in two days.*

In connection with the facts which have been stated, it seems proper to allude to the dangerous and often fatal effects which have followed from wounds received in the post-mortem examination of patients who have died of puerperal fever. The fact that such wounds are attended with peculiar risk has been long noticed. I find that Chaussier was in the habit of cautioning his students against the danger to which they were exposed in these dissections.† The head ***pharmacien*** of the Hotel Dieu, in his analysis of the fluid effused in puerperal peritonitis, says that practitioners are convinced of its deleterious qualities, and that it is very dangerous to apply it to the denuded skin.‡ Sir Benjamin Brodie speaks of it as being well

* Lancet, May 2d, 1840.

† Stein, l'Art de Accoucher, 1794. Dict. des Sciences Medicales, Art. Puerperal.

‡ Journal de Pharmacie, Jan. 1836.

known that the inoculation of lymph or pus from the peritoneum of a puerperal patient is often attended with dangerous and even fatal symptoms. Three cases in confirmation of this statement, two of them fatal, have been reported to this Society within a few months.

Of about fifty cases of injuries of this kind, of various degrees of severity, which I have collected from different sources, at least twelve were instances of infection from puerperal peritonitis. Some of the others are so stated as to render it probable that they may have been of the same nature. Five other cases were of peritoneal inflammation; three in males. Three were of what was called enteritis, in one instance complicated with erysipelas; but it is well known that this term has been often used to signify inflammation of the peritoneum covering the intestines. On the other hand, no case of typhus or typhoid fever is mentioned as giving rise to dangerous consequences, with the exception of the single instance of an undertaker mentioned by Mr. Travers, who seems to have been poisoned by a fluid which exuded from the body. The other accidents were produced by dissection, or some other mode of contact with bodies of patients who had died of various affections. They also differed much in severity, the cases of puerperal origin being among the most formidable and fatal. Now a moment's reflection will show that the number of cases of serious consequences ensuing from the dissection of the bodies of those who have perished of puerperal fever, is so vastly disproportioned to the relatively small number of autopsies made in this complaint as compared with typhus, or pneumonia, (from which last disease not one case of poisoning happened), and still more from all diseases put together, that the conclusion is irresistible that a most fearful morbid poison is often generated in the course of this disease. Whether or not it is *sui generis*, confined to this disease, or produced in some others, as for instance erysipelas, I need not stop to inquire.

In connection with this may be taken the following statement of Dr. Rigby. "That the discharges from a patient under puerperal fever are in the highest degree contagious, we have abundant evidence in the history of lying-in hospitals. The puerperal abscesses are also contagious, and may be communicated to healthy lying-in women by washing with the same sponge; this fact has been repeatedly proved in the Vienna Hospital; but they are equally communicable to women not pregnant; on more than one occasion the women engaged in washing the soiled bed-linen of the General Lying-in Hospital

have been attacked with abscess in the fingers or hands, attended with rapidly spreading inflammation of the cellular tissue."*

Now add to all this the undisputed fact that within the walls of lying-in hospitals there is often generated a miasm, palpable as the chlorine used to destroy it, tenacious so as in some cases almost to defy extirpation, deadly in some institutions as the plague; which has killed women in a private hospital of London so fast that they were buried two in one coffin to conceal its horrors; which enabled Tonellé to record two hundred and twenty-two autopsies at the Maternité of Paris; which has led Dr. Lee to express his deliberate conviction that the loss of life occasioned by these institutions completely defeats the object of their founders; and out of this train of cumulative evidence, the multiplied groups of cases clustering about individuals, the deadly results of autopsies, the inoculation by fluids from the living patient, the murderous poison of hospitals, does there not result a conclusion that laughs all sophistry to scorn, and renders all argument an insult?

I have had occasion to mention some instances in which there was an apparent relation between puerperal fever and erysipelas. The length to which this paper has extended does not allow me to enter into the consideration of this most important subject. I will only say that the evidence appears to me altogether satisfactory that some most fatal series of puerperal fever have been produced by an infection originating in the matter or effluvia of erysipelas. In evidence of some connection between the two diseases, I need not go back to the older authors, as Pouteau or Gordon, but will content myself with giving the following references, with their dates; from which it will be seen that the testimony has been constantly coming before the profession for the last few years.

London Cyclopedia of Practical Medicine—article Puerperal Fever. 1833.

Mr. Ceeley's Account of the Puerperal Fever at Aylesbury. Lancet, 1835.

Dr. Ramsbotham's Lecture. London Medical Gazette, 1835.

Mr. Yates Ackerley's Letter in the same Journal, 1838.

Mr. Ingleby on Epidemic Puerperal Fever. Edinburgh Medical and Surgical Journal, 1838.

Mr. Paley's Letter. London Medical Gazette, 1839.

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* System of Midwifery, p. 292.

Remarks at the Medical and Chirurgical Society. Lancet, 1840.

Dr. Rigby's System of Midwifery. 1841.

Nunneley on Erysipelas—a work which contains a large number of references on the subject. 1841.

British and Foreign Quarterly Review, 1842.

Dr. S. Jackson, of Northumberland, as already quoted from the Summary of the College of Physicians, 1842.

And lastly, a startling series of cases by Mr. Storrs, of Doncaster, to be found in the American Journal of the Medical Sciences for January, 1843.

The relation of puerperal fever with other continued fevers, would seem to be remote and rarely obvious. Hey refers to two cases of synochus occurring in the Royal Infirmary of Edinburgh, in women who had attended upon puerperal patients. Dr. Collins refers to several instances in which puerperal fever has appeared to originate from a continued proximity to patients suffering with typhus.*

Such occurrences as those just mentioned, though most important to be remembered and guarded against, hardly attract our notice in the midst of the gloomy facts by which they are surrounded. Of these facts, at the risk of fatiguing repetitions, I have summoned a sufficient number, as I believe, to convince the most incredulous, that every attempt to disguise the truth which underlies them all, is useless.

It is true that some of the historians of the disease, especially Hulme, Hull and Leake, in England; Tonellé, Dugès and Baudelocque, in France, profess not to have found puerperal fever contagious. At the most they give us mere negative facts, worthless against an extent of evidence which now overlaps the widest range of doubt, and doubles upon itself in the redundancy of superfluous demonstration. Examined in detail, this and much of the show of testimony brought up to stare the daylight of conviction out of countenance, proves to be in a great measure unmeaning or inapplicable, as might be easily shown were it necessary. Nor do I feel the necessity of enforcing the conclusion which arises spontaneously from the facts which have been enumerated, by formally citing the opinions of those grave authorities who have for the last half century been sounding the unwelcome truth it has cost so many lives to establish.

"It is to the British practitioner," says Dr. Rigby, "that we are

* Treatise on Midwifery, p. 228.

indebted for strongly insisting upon this important and dangerous character of puerperal fever."*

The names of Gordon, John Clarke, Denman, Burns, Young,† Hamilton,‡ Haighton,§ Good,‖ Waller,¶ Blundell, Gooch, Ramsbotham, Douglas,** Lee, Ingleby, Locock,†† Abercrombie,‡‡ Alison,§§ Travers,‖‖ Rigby, and Watson,¶¶ many of whose writings I have already referred to, may have some influence with those who prefer the weight of authorities to the simple deductions of their own reason from the facts laid before them. A few continental writers have adopted similar conclusions.*** It gives me pleasure to remember that while the doctrine has been unceremoniously discredited in one of the leading Journals,††† and made very light of by teachers in two of the principal Medical Schools of this country, Dr. Channing has for many years inculcated and enforced by examples the danger to be apprehended and the precautions to be taken in the disease under consideration.

I have no wish to express any harsh feeling with regard to the painful subject that has come before us. If there are any so far excited by the story of these dreadful events, that they ask for some word of indignant remonstrance, to show that science does not turn the hearts of its followers into ice or stone, let me remind them that such words have been uttered by those who speak with an authority I could not claim.‡‡‡ It is as a lesson rather than as a reproach that I call up the memory of these irreparable errors and wrongs. No tongue can tell the heart-breaking calamity they have caused; they have closed the eyes just opened upon a new world of love and happiness; they have bowed the strength of manhood into the dust; they have cast the helplessness of infancy into the stranger's arms, or bequeathed it with less cruelty the death of its dying parent. There is no tone deep enough for regret, and no voice loud enough for warning. The woman about to become a mother, or with her new-born infant upon her bosom, should be the object of trembling care and sympathy wherever she bears her tender burden, or stretches her aching limbs. The very outcast of the streets has pity upon her

* British and Foreign Med. Review for Jan. 1842. † Encyc. Britannica, xiii, 467, Art. Medicine. ‡ Outlines of Midwifery, p. 109. § Oral Lectures, &c. ‖ Study of Medicine, ii. 195. ¶ Medical and Physical Journal, July, 1830. ** Dublin Hosp. Reports for 1822. †† Library of Pract. Medicine, i. 373. ‡‡ Researches on Diseases of the Stomach, &c. p. 181. §§ Lib. of Pract. Medicine, Vol. i. p. 96. ‖‖ Further Researches on Constitutional Irritation, p. 128. ¶¶ Lond. Med. Gaz. Feb. 1842. *** See British and Foreign Medical Review, Vol. iii. p. 525, and Vol. iv. p. 517. Also Ed. Med. and Surg. Journal for July, 1824, and American Journal of Med. Sciences for Jan. 1841. ††† Phil. Med. Journ. Vol. xii. p. 364. ‡‡‡ Dr. Blundell and Dr. Rigby in the works already cited.

sister in degradation when the seal of promised maternity is impressed upon her. The remorseless vengeance of the law, brought down upon its victim by a machinery as sure as destiny, is arrested in its fall at a word which reveals her transient claim for mercy. The solemn prayer of the liturgy singles out her sorrows from the multiplied trials of life, to plead for her in the hour of peril. God forbid that any member of the profession to which she trusts her life, doubly precious at that eventful period, should hazard it negligently, unadvisedly, or selfishly!

There may be some among those whom I address, who are disposed to ask the question, What course are we to follow in relation to this matter? The facts are before them, and the answer must be left to their own judgment and conscience. If any should care to know my own conclusions, they are the following; and in taking the liberty to state them very freely and broadly, I would ask the inquirer to examine them as freely in the light of the evidence which has been laid before him.

1. A physician holding himself in readiness to attend cases of midwifery, should never take any active part in the post-mortem examination of cases of puerperal fever.

2. If a physician is present at such autopsies, he should use thorough ablution, change every article of dress, and allow twenty-four hours or more to elapse before attending to any case of midwifery. It may be well to extend the same caution to cases of simple peritonitis.

3. Similar precautions should be taken after the autopsy or surgical treatment of cases of erysipelas, if the physician is obliged to unite such offices with his obstetrical duties, which is in the highest degree inexpedient.

4. On the occurrence of a single case of puerperal fever in his practice, the physician is bound to consider the next female he attends in labor, unless some weeks, at least, have elapsed, as in danger of being infected by him, and it is his duty to take every precaution to diminish her risk of disease and death.

5. If within a short period two cases of puerperal fever happen close to each other, in the practice of the same physician, the disease not existing or prevailing in the neighborhood, he would do wisely to relinquish his obstetrical practice for at least one month, and endeavor to free himself by every available means from any noxious influence he may carry about with him.

6. The occurrence of three or more closely connected cases, in the practice of one individual, no others existing in the neighborhood, and no other sufficient cause being alleged for the coincidence, is *prima facie* evidence that he is the vehicle of contagion.

7. It is the duty of the physician to take every precaution that the disease shall not be introduced by nurses or other assistants, by making proper inquiries concerning them, and giving timely warning of every suspected source of danger.

8. Whatever indulgence may be granted to those who have heretofore been the ignorant causes of so much misery, the time has come when the existence of a *private pestilence* in the sphere of a single physician should be looked upon not as a misfortune but a crime; and in the knowledge of such occurrences, the duties of the practitioner to his profession, should give way to his paramount obligations to society.

Art. VI.—*Aneurism of the Aorta—fatal.*

The following cases of aneurism of the aorta we have received from Dr. J. C. Dalton, of Lowell, with the request that we would give them a place in our Journal.

1st. Robert Patterson, carpet weaver, aged about 45, had complained for several months to his friends of pain in the cardiac region, dyspnœa on motion, &c. Eat a very hearty breakfast on the morning of the 12th January, 1837, went into the mill to a room in the 3d story, and while in the act of throwing off his great coat, fell back, gave one shriek, and gasping, immediately expired.

Autopsy.—On denuding the body, the chest was found unduly arched over cardiac region, and the sound on percussion dull for a space of 8 inches square, extending considerably to the right of the median line. Emaciation. On raising sternum, extensive and firm adhesions of the pleuræ of both lungs to each other and to the diaphragm—both lungs pushed to their respective sides by the distended pericardium, which was filled to its utmost with a fluid. This, with the enclosed heart, the aortal arch, and trachea, we removed from the chest. On opening the pericardium, a large quantity of serum flowed out, leaving the heart completely enveloped in a clot, like a mould. On removing this clot, or mould, we found the heart enor-

mously enlarged, and very firm, owing to great hypertrophy of the left ventricle; the diameter of the aorta to beyond the arch very much increased. On slitting open the aorta, the whole internal surface exhibited marks of old disease, being rough, and covered extensively with patches of lymph, varying in size from a pin's head to the finger nail. About one inch above the aortal valves, there was a deep ulceration of the serous and muscular coats; about two inches above, and one inch below the going off of the arteria innominata, an ulceration about the size of a sixpence had perforated the walls of the aorta, by which the blood was injected into the cavity of the pericardium, the cause of the patient's instantaneous death, by embracing the heart as with the gripe of a vice. Between the innominata and the carotid of the other side, precisely against the trachea, the walls of which it had nearly reached, there was another ulceration, somewhat larger than the one already described, and which must soon, if the previous one had not already anticipated this result, have inevitably opened into the trachea, by which event the patient's life would have been terminated by the ejection of torrents of blood from the mouth.

In the above detailed case there was no formation of an aneurismal sac, as there would have been had the ulceration been higher up the arch of the aorta. The external or cellular coat being more extensible than the others, and which in this case was wanting, from the anatomical peculiarity of the parts where the ulceration obtained, viz., the origin of the aorta. Here the aorta, being strengthened, says Bertin (Chauncy's translation, p. 134), by a fold of the pericardium, is deprived of the cellular coat, consequently the destruction of the coats at this point is followed by a perforation and epanchement (pouring out) of blood into the pericardium, and the formation of an aneurismal sac does not occur.

The pericardium ascends on the great vessels as high as the commencement of the arch of the aorta, and opposite to the second ribs.

A case analogous to the foregoing, in the principal characteristics, will be found detailed in Bertin (Chauncy's translation, p. 57), on which the author remarks: "This very interesting case presents us with a morbid lesion of which the records of medicine contain but few examples. It is seldom we have an opportunity of observing perforative ulcerations of the aorta opening into the pericardium; nevertheless we find some facts of this kind in Morgagni, &c." (Bertin, Chauncy's translation, p. 60.)

2d. ***Aneurism of the Aorta, fatal, during the progress of Phthisis Pulmonalis.***

The subject of the present case, a married female, aged about 45 years, was received into the Lowell Almshouse, under the care of Dr. C. P. Coffin. Had an attack of inflammatory disease of the chest, six weeks previously, in Maine; does not know what.

Symptoms, on entrance, as follows. Dry and sharp cough. Dyspnœa. Can lie equally well on either side. Slight hectic, with burning palms and feet. Pulse accelerated. Progressive emaciation. Dull sound over left thorax, from top to bottom, before and behind. Sonorous every where on right, except at the root of the lung. Diseased side smaller by an inch, by accurate admeasurement, than the right. Vesicular murmur inaudible on left, puerile on right.

She was put upon alterative doses of Submuriate, Ipecac and Opium, with perpetual vesication; under which treatment a gradual amendment seemed to be taking place, when on ——, in the midst of lively conversation, there suddenly issued from her mouth a torrent of blood, followed by instant death.

Autopsy.—On raising the sternum, numerous bands of false membrane were seen passing from the left lung to the pleura, while behind the adhesion was entire. A pint and a half of serum, intermingled with shreds of organized lymph, with which the surface of the lung was covered, were removed from the pleural cavity.

Lungs. Left carnified and tuberculous, containing several cavities, particularly at its apex. The right parietes over fourth, fifth, and sixth ribs, particularly prominent, and the corresponding lung which occupied this space did not collapse in the least, but appeared emphysematous, was red and injected.

Heart and pericardium healthy externally, in the last more than the healthy amount of serum. A large sac, of the size of a lemon, and of irregular shape, commencing an inch below the subclavian, arose from the aorta, the posterior wall of which rested upon the spine, the periosteum of which was denuded and absorbed, leaving the surface rough. This sac had broken into the left bronchus.

The emphysematous state of the right lung, and the fact of the parietes being tied down by the bands above mentioned, account for the anomalous appearances which confused, in some measure, the diagnosis.

ART. VII. *Cases illustrating the Diagnosis of Acute Diseases of the Heart in Children.* Read before the Boston Society for Medical Improvement, by JOHN WARE, M.D.

IT may appear scarcely worth while to some, at the present day, when we are able, by physical signs, to recognize so exactly the character of diseases within the chest, to offer cases whose object is to illustrate their diagnosis merely by their general course and history. I conceive that it will not, however, be useless, for two reasons. In the first place, the examination of children, especially of infants, in order to the very minute determination of physical signs, is one of considerable difficulty, particularly where the heart is concerned; and I think it would not be easy for any one, unless he have had very extensive opportunities for observing cardiac diseases in patients of this class, to satisfy himself of their existence by physical signs alone. Besides this, the difficulties in the way of a very perfect acquaintance with the mode of detecting disease by physical signs, are such—at least as a large portion of practitioners in this country are and will be educated—that probably a majority of them must for the present depend mainly upon rational signs in their diagnosis of disease. Every thing, therefore, which will render more exact our knowledge of the rational signs, is worthy of record. There is also, perhaps, some danger—from the greater satisfaction which there is in the detection of disease by physical signs, from the greater certainty which this method presents to those who are well acquainted with it, and from the fact, also, that writers on diseases are generally those who have possessed themselves of this kind of knowledge—that the study of the other means of diagnosis may be somewhat slighted and undervalued.

It should be observed that these cases were not very minutely recorded, and that I give therefore only a brief and general description of their most characteristic symptoms. It should also be observed, that the two first occurred before I was sufficiently accustomed to the practice of auscultation to allow me to place any considerable reliance on the results derived from it.

The first case occurred in a nursing infant of 8 months. She was moderately affected by measles, in the second week of April, 1832, went well through with its ordinary course, and ceased in a few days to be an object of attention, although, other children being sick in the family with the same disease, I was a daily visiter.

April 23, I was again asked to look at her, and found her with considerable cough, a rapid pulse, quite pale, but very quiet and sleepy, presenting, as I supposed, no very urgent symptoms. She became, however, from day to day, very rapidly worse, and on the

26th, Her aspect was very bad. The countenance and lips were then very pale; she had a remarkably heavy look, especially about the eyes; she took no notice, or but very little; there was much apparent distress in breathing; each expiration was accompanied by a lengthened groan, but there was not much heaving of the chest. Pressure on the abdomen increased the dyspnœa. The pulse were 160. Respirations 48.

28th. The same symptoms had continued and increased in intensity. The countenance was pale and cold, the lips livid; the hands were cool, smooth, and had a dark, almost blackish tinge. There was much short hacking cough, which seemed to annoy her a good deal; and the respiration was accompanied by the same groaning sound. The pulse continued very rapid, but was so feeble as not to be easily counted.

30th. Had had some intervals of ease, with return of heat, looser cough, and diminution of lividity. Essentially the same symptoms had continued, and to-day she sunk rapidly, and died at 4, P. M., just a week from the day on which the attention of her parents was first called to this attack.

The most noticeable symptoms in this case were, a continued shrinking of the countenance, and a paleness of the countenance lips and hands, which gave place only to a degree of lividity; a muddy, heavy, unconscious appearance of the eyes; a total absence of flush or redness of the skin even during the few periods of general heat; a constant smallness, feebleness, with great frequency of the pulse; and more than all, an unmitigated distress of breathing throughout the disease, not accompanied by the violent efforts and heaving of the chest which often accompany dyspnœa, but marked by a kind of tranquillity and quietness of suffering, which gave to it a very different character.

On *dissection*, there was found in the right thorax, inflammation of the pleura, with effusion of lymph over its whole posterior surface, from the apex to the lower edge of the lower lobe. It was also extensively connected by recent lymph to the diaphragm, with some cavities containing thin pus. The substance of the lungs was also inflamed. In the left chest, the pleura was every where in the same

condition, with the exception of a small portion covering the upper lobe, near the sternum. Lymph in some parts was of the thickness of two or three lines. Pus was found in some small pleuritic cavities, and sero-purulent fluid in the common cavity. Lungs in a healthy state only in the small portion of the upper lobe, which was covered by sound pleura.

The cavity of the pericardium contained bloody serum. The pericardium was covered, like the pleura, with a layer of lymph.

Case II. The subject of this case was a male, aged one year. He had suffered in the preceding winter from very severe pneumonitis; but his health had since been as good as usual. He had just recovered from chicken-pox when he was seized with the disease of which he died. The record of the details of the symptoms during life is very scanty, but it embraces the most important particulars. I was called to him June 8, 1832, and he died June 15. The peculiar symptoms were, the same great but quiet anguish of respiration, as that noted in the former case, but with more intervals of ease; the same remarkable and constant paleness of the lips and countenance, and an equal rapidity of pulse and respiration. The pulse varying from 160 to 176, and the respirations amounting sometimes to 84.

On *dissection*, there was found general consolidation of the lungs of the *right side*; the air penetrated no portion of them. In the upper lobe there were found a great number of small masses of lymph or concrete pus, plugging up the extreme divisions of the bronchi; the largest about the size of a common pea. The whole pleura was covered by a layer of lymph, with a quantity of serum in the cavity of the chest.

The lower lobe of the lungs of the *left side* was in the same condition, both as to its substance and the pleura, with those of the right side; but the upper lobe was in all respects in a perfectly healthy condition, and was the only portion of the organs into which air entered.

The heart was pale, and the pericardium universally covered with a layer of lymph.

Case III. I was called, Nov. 30, 1836, at 4, A. M., to a male child, eight months old, of whose case I collected the following particulars. It had always been fat and healthy—had been warmly clothed, and in all respects well taken care of; had been weaned within the last fortnight. On the night of the 28th, was uneasy and refused food. All day yesterday (29th) he also refused food, had occasionally chilly

turns, with cold hands and feet, paleness of the face, and a cold sweat about the forehead. There was no cough, so far as the parents had noticed, and no difficulty of breathing. Indeed there were no symptoms which had created any alarm, or led them to believe that this was anything more than a slight indisposition from cold. Through the day he had at times noticed as usual, had been playful, and was bright and playful when he was put to bed in the evening.

In the course of the night he became much distressed, and his breathing was accompanied by groaning. At intervals, however, he fell away into a state of sleep or stupor, from which he was roused by the return of the distress. This became so urgent, that at four o'clock I was called to him. He was sitting quite erect in his mother's lap, heaving himself backward and forward in great agony. Each act of respiration was accompanied by a moan, cry, and sometimes indeed almost by a shriek. The sound of respiration was heard but very obscurely in any part of the chest. There was no pulse at the wrist, and I could not detect either the impulse or sounds of the heart by the ear. The countenance generally, but particularly the lips, were very pale. The eyes were open and looked around at times as if he might be conscious and take notice; for the most part, however, he did not seem capable of it. He died at seven o'clock, A. M., three hours from the time of my being called to him.

On *dissection*, the lungs were found perfectly healthy in all parts. There was about a drachm of serum in the pericardiam. The heart was large—the vessels on its surface were very full of blood—there was an effusion of blood in patches beneath the serous membrane, in various parts, and at the base of the left ventricle a coagulum beneath this membrane as big as half a pea. In the same part there was a prominence resembling a papular eruption. The cavities and valves were natural. The right auricle very full of blood. The texture of the muscular portions of the organ was remarkably soft, and was very easily torn by the finger. It was also quite pale. There was about half an ounce of serum in the cavity of the peritoneum.

The most remarkable, and indeed the only striking morbid change in this last case, was the softness of the muscular texture of the heart. This was such as I have seen in only very few cases, and these were of unequivocal disease of the heart, being complicated with well-marked inflammation of the pericardium.

Case IV. was that of a female child, eleven months old, nursing, to which I was called March 26, 1838, when I found that it had la-

bored under severe symptoms for a week. Its history was that of a case of pneumonitis, and it presented, on examination, its usual physical signs—dulness and bronchial respiration in the lower two thirds of the right back. But it had presented a few other symptoms. The respiration had been and was much more difficult than usually attends an inflammation of the lungs of one side of no greater extent. It was accompanied for a considerable part of the time with a distressing groan or grunt. Early in the case there had been a great degree of sleepiness or stillness. The left side of the face, the left arm and hand, were very cold and mottled of a dark red or livid color, resembling the congested condition of the capillaries in a dying person. This had been their state, more or less, throughout the case. The pulse were 180, and the respirations 76. There was no dulness detected on percussion over the heart.

There was for several days some alleviation of the distress of breathing, a diminished frequency of the pulse and respiration, a return of warmth, and an improved circulation of the left side of the face, and on the 28th the pulse had fallen to 132 and the respiration to 52, with a corresponding mitigation of other symptoms. On the morning of the 29th, however, a great change had taken place. The pulse were at the rate of 180 in the minute, intermitting at every third beat, and were extremely feeble. The respirations were 60, with a constant groan, the face and lips were cold and congested, and the hands cold. Death took place at 10 P. M.

On *dissection*, there was found extensive hepatization of the lungs of the right side, with lymph on the pleura, and pus in the cavity of the chest. Congestion of the lower lobe of the lungs of the left side. Two ounces of fluid of a sero-purulent character were found in the pericardium, and the whole membrane was covered with coagulable lymph.

In comparing these cases, it is obvious to remark in the first place, that the great amount of disease in the two first prevents us from attributing the urgent symptoms and the fatality of them wholly to the pericarditis. An amount of similar disease on both sides of the chest, probably always proves fatal without any such complication. But the symptoms in these cases, in which they differed from common cases of very severe and even fatal pleuro-pneumonia, were the paleness of the face and lips, the smallness and feebleness of the pulse, as well as their great frequency, and the "mortal anguish" which accompanied and was produced by the breathing, although at the same

time the patient was comparatively still and tranquil. The same symptoms were also present in the third case; and though this was an affection of the heart of a different character from either of the former, still so far as these particular symptoms are concerned, this does not diminish the probability that they may be regarded as indicative of some affection of the heart which interferes with its function as a muscular organ, since this function is very likely to be impaired by a disease which attacks its surface only. I consider the fact, indeed, that the same symptoms have been thus found connected with different affections of the heart, in some cases with and in some without, concomitant disease of the lungs, as confirming the opinion that they are to be regarded as proceeding from the state of action of the heart.

The fourth case differed from the two first in the less amount of disease of the lungs, whilst its intensity in the pericardium was greater—or rather probably the condition of the lungs permitted life to continue longer, and thus the disease in the pericardium was sufferred to run on to a later stage. In this case there was the same great frequency and feebleness of the pulse—the rapidity and anguish of respiration—with at the same time a stillness and tranquillity—but with quite a different state of the capillary circulation of the face, lips and hands. This state of the capillary circulation, however, although differing from that presented in the former cases, is also not less different from what we usually meet in simple pulmonary disease, and is therefore to be noted as one circumstance tending to illustrate the history of the class of cases to which it belongs.

Art. VIII.—*Operations for Fissure of the Soft and Hard Palate.* (Palatoplastie.) By J. Mason Warren, M.D.

According to Malgaigne, the congenital fissures of the palate present themselves under three different forms. 1st. ***In the simple state***, that is, where the soft palate is divided in the median line, without any loss of substance, and without any division of the palatine vault; under these circumstances, at the moment of deglutition, the two separated portions may be seen to come almost into perfect contact, by a muscular action which it is not very easy to explain.

Sometimes the division is confined to only a part of the soft palate, this always being the most inferior portion. 2d. ***With a partial division of the hard palate***, whether the ossa palati are alone divided, or where it extends in part into the maxillary bones; in both these cases there is a simple fissure, terminated by an angle in front. 3d. ***With a complete division of the bony palate.*** In this case there is a greater or less separation of the two halves of the palatine vault, and almost always a double fissure of the lip, and of the alveolar processes.*

Having thus offered a description of the different forms under which the fissures of the palate may present themselves, we proceed to take a slight sketch of the operations which have been proposed for their relief. In 1828 M. Roux performed the operation of staphaloraphy, or suture of the soft palate, on a young medical student; the operation was followed by complete success, and by the restoration of voice to the patient. Roux was soon succeeded by Graeffe, of Germany, who has since contested the priority of the invention with the former surgeon, and by Dr. Warren, of Boston, who not having seen the method of Roux described, made use of instruments of his own invention. This most valuable discovery at once took a high rank in surgery, as being one of the most delicate to perform, and the most gratifying when successful of any of the operations in which life is not concerned, that the surgeon is called upon to practise. Thus far, however, the operation was alone limited to remedying fissures of the soft palate, rejecting by far the most numerous class of cases of this malformation, viz., those in which the jaws and hard palate are implicated. The following method, however, had been suggested by Roux, and more recently has been carried into practice by him, for operating on the soft palate where the above-named complications existed; this was to cut away the soft parts for the space of an inch on either side, from the arch of the palatine bones, stretch them across the fissure, and unite them by sutures, leaving the apertures which remained in the bones, in case union of the soft parts took place, to be covered by a metallic plate. It was in performing this operation that I was led to see the futility of attempting it excepting where the palatine bones were slightly separated, and which suggested to me certain modifications which I have since been fortunate enough to put into successful practice. This method which I propose to describe, if it does not always succeed in

* Malgaigne Med. Op.

completely closing the fissures of both the soft and hard palate, more frequently results in the closure of the former, than the one recommended by Roux, and in some cases entirely obliterates the whole extent of the aperture both in the bones and soft parts.

The form of operation which I have practised will be best illustrated by the relation of the first case in which it was put into execution.

The patient was a young man, 25 years old, with a congenital fissure of the soft and hard palate, the bones being separated quite up to the alveolar processes, with a deviation to the left side. On looking into the mouth, the whole posterior fauces were exposed, with the openings of the eustachian tubes and the bottom of the nasal cavity of the left side distinctly visible. The speech of the patient was rendered so indistinct, by this misfortune, that it was with the greatest difficulty that he could make himself understood. Deglutition had always been imperfectly performed, liquids, particularly, being swallowed with much difficulty, and often regurgitated through the nose. At the first glance the soft parts were scarcely perceptible, being almost concealed in the sides of the throat from the action of the muscles. On being seized by a forceps they could be partially drawn out, though with great resistance. So far as any of the old methods were applicable to the relief of this extensive fissure, the patient was beyond surgical aid. I determined, however, to put in practice the operation which had before appeared to me practicable.

The patient was placed in a strong light, his mouth widely opened, and the head well supported by an assistant; with a long, double-edged knife, curved on its flat side, I now carefully dissected up the membrane covering the hard palate, pursuing the dissection quite back to the root of the alveolar processes. By this process, which was not effected without considerable difficulty, the membrane seemed gradually to unfold itself, and could be easily drawn across the very wide fissure. A narrow slip was now removed from the edges of the soft palate, and with it the two halves of the uvula. By this means a continuous flap was obtained, beginning at the roots of the teeth and extending backwards to the edges of the velum palati. Finally, six sutures were introduced, on tying of which the whole fissure was obliterated. The patient was directed to maintain the most perfect quiet, and to abstain from making the slightest efforts to swallow even the mucus which collected in the throat, which was to be carefully sponged out as occasion required.

The following day he was doing well. He complained of some pain, or rather a sensation of excessive emptiness of the bowels, which was relieved by the use of a hot spirituous fomentation. On the third day, a slight hacking cough commenced, owing to the collection of thick ropy mucus in the throat and air-passages. The cough was temporarily relieved by an injection of a pint of oat-meal gruel into the rectum; during the night, however, it again increased so much as to tear away the upper and lower ligatures. I now allowed him to take liquid nourishment, which at once quieted the irritation in the throat. The other four ligatures were removed on the following days, the last being left until the 6th after the operation. This patient returned home into the country at the end of three weeks, a firm fleshy palate being formed behind, and half the fissure in the bony palate obliterated.

In the following spring I again operated on the remaining fissure in the hard palate, and succeeded in closing about half the extent of it, the tissues yielding with some difficulty, owing to the inflammation caused by the former operation. The small aperture which remained I directed to be closed by a gold plate. His speech was very much improved at once as well as the powers of deglutition, and he will, no doubt, ultimately, as the soft parts become more flexible, to a great degree recover the natural intonations of the voice.

Since performing this operation, I have had occasion to repeat it in thirteen different cases, which with one exception have terminated successfully, either in the closure of the whole fissure, or of both hard and soft palate, or so far that the aperture which remained in the bones could be easily closed by an obturator fitted to the adjoining teeth. Some of these cases have been exceedingly interesting.

In one case, a female, 35 years old, the fissure implicated not only the soft and hard palate, but also was complicated with a hare lip and division through the alveolar processes, the teeth being separated for the space of an inch. In this patient the fissure in the mouth was first operated on. The side of the nose, which was stretched across the fissure and consequently much flattened, was then carefully dissected up, together with the lip which supported it, from its attachment to the jaw, drawn across the opening and confined by pins and sutures. I was assisted in this operation, which was a very tedious one, the deformity being the most serious that had ever come under my notice, by Drs. Warren, Cabot, Roby and Keep. The patient was directed to keep quiet in bed, and to have an injection

of gruel every four hours. The operation was performed on the 23d of June, 1841. On the 28th the pins were removed from the lip, which had united by the first intention; two of the sutures of the throat were also cut away. Some faintness arising from exhaustion, and from placing her in the upright posture, she was allowed to take liquid nourishment. On the 20th the other sutures were removed, a perfect union having taken place throughout. She returned home well on the 1st of July, seven days from the time of the operation. The improvement in her speech and appearance can only be appreciated by those who saw the patient. Previous to returning home, it was found necessary to remove one of the incisor teeth, which projected so far forward as to press upon and cause a deep ulceration of the adjacent soft parts.

The last case to which we shall allude, was operated on in the month of December, 1842. The patient was a young man, 20 years old, from Cambridge, whose prospects in life were materially affected by the malformation under which he labored, a division of the hard and soft palates, the bony separation being about three quarters of an inch. His speech was very imperfect; the deglutition not much affected. I was assisted in the operation by Dr. Hayward, Jr., Dr. Wellington, of Cambridge, and Mr. Townsend. The cutting part was done as in the preceding case, followed by the introduction of sutures. The threads were all removed in 48 hours, the adhesion being perfect. A small aperture afterwards appeared at the upper angle of the fissure, from a slough where the threads had been too tightly drawn; by touching this with the nitrate of silver, it was obliterated in a fortnight, and his speech almost completely restored. He was seen by a number of medical gentlemen before leaving town. In this case the improvement of speech was at once more marked than in any previous case; as a reasonable amount of time must necessarily be supposed to elapse even in the most simple fissures, before the soft parts, stretched almost to the tightness of a drum-head, can be expected to regain their natural and healthy movements.

I shall now proceed to make some remarks on various interesting circumstances which have been presented, both in the forms of this affection, and in the method of operation.

1st. As regards the fissure itself. In all patients which have thus far come under my notice, the direction of the fissure has been towards the left side of the jaw; and with infants on whom I have been called to perform the operation of hare lip complicated with

the above malformation, the jaw has been invariably divided to the left side of the median line. I have observed also, in simple hare lip, that the preference is to the left side of the face, and to this I have seen but a single exception. It will be generally found in those cases where the fissure of the maxillary bones is complete, that the bones forming the roof of the mouth are forced upwards, as it were, the palatine process of the superior maxillary bone of the right side being continuous with the vomer. This circumstance much increases the difficulty of the operation in this region, making the mucous membrane less accessible, which when detached and dragged into the horizontal line of course loses its support from the bones behind, at least this will be the case where the obliquity of the bones is considerable.

It would naturally be supposed, that from the want of protection to the mucous membrane lining the nostrils and posterior fauces, and the immediate contact of air and of foreign substances, the patient would be more liable to inflammatory affections of these parts; this, however, on inquiry, was not found to be the case, none of them being more than ordinarily liable to catarrhal attacks.

Operation.—The following is the method I have usually adopted. The patient is placed on a low seat, in a strong light, his head firmly supported on the breast of an assistant, who raises or depresses it as circumstances may require. He is directed to keep the jaws widely separated, to retain any blood which may collect as long as possible, so as not to embarrass the operator, and restrain all efforts at coughing. To do this will require constant warnings and encouragement on the part of the surgeon, as there is a natural tendency to close the mouth as soon as any pain is felt, or there arises any collection of blood or mucus in the fauces which interferes with respiration. The use of a speculum, as directed by some operators, is altogether inadmissible; it not only obscures the light, but also prevents the proper manœuvres of the instruments. The mucous membrane of the hard palate is now to be carefully separated from the bones with a long, double-edged bistoury, curved on its flat side, and is rather pealed than dissected off, from the difficulty of making any sawing motion with the knife in this confined situation, the obstacles always being greater in proportion to the obliquity of the palatine vault. As the dissection approaches to the connection of the soft parts with the edges of the ossa palati, where the muscles are attached and the union most intimate, great care

must be taken or the mucous membrane will be perforated, and from these causes I have found this part of the operation to be the most embarrassing. As soon as this dissection is terminated, it will generally be found that by seizing the soft palate with a forceps it can be easily brought to the median line. If the fissure is wide, and this cannot be effected, I have found the following course to be invariably followed by success. The soft parts being forcibly stretched, a pair of long, powerful French scissors, curved on the flat side, are carried behind the anterior pillars of the palate; its attachments to the tonsil and to the posterior pillar are now to be carefully cut away, on which the anterior soft parts will at once be found to expand, and an ample flap be provided for all desirable purposes.

The edges of the palate may now be made into a raw surface by seizing them on either side with a hooked forceps and removing a slip with the scissors or a sharp-pointed bistoury. Our next object is to insert the ligatures, and for this purpose an immense armory of instruments have been invented. After the trial of nearly all of them I have found the most simple to be the most effectual. A small curved needle being armed with a strong silk thread, confined in a forceps with a movable slide, is introduced to the upper edge of the fissure, the needle being carried from before backwards on the left side, and from behind forwards on the right, or vice versa. In this manner, three, four or more ligatures may be successively introduced. The patient is now requested to clear his throat of mucus and blood, the ligatures are wiped dry and waxed, and tied with deliberation, beginning at the upper and proceeding gradually downwards, waiting a little between each ligature, in order to allow the throat to accommodate itself to this sudden and almost insupportable tension of the soft parts. No forceps are required for holding the first knot while the second is tied; the object is better effected by using the surgeon's knot, that is, by making two turns of the thread instead of one, and by enjoining perfect quiet on the patient for the moment, until the second knot is tied. It has been advised by some surgeons to wait a certain length of time, after the cutting part of the operation, before inserting the ligatures, five or six hours for instance, to allow all bleeding from the wound to cease. This appears to me a useless prolonging of the patient's suffering, and entirely unnecessary. I have never seen, in a single instance, either in the operations of surgeons abroad or in my own experience, any hemorrhage, that a little iced water, or the pressure for a short period with the finger,

would not easily arrest. The after treatment will not here require any notice, as it has been sufficiently noted in the previous detail of the cases.

In all the operations of this kind which I have lately had occasion to perform, the ligatures have been removed at the end of 48 hours, or at the farthest three days, and to this circumstance may be partly attributed the successful termination. If the threads be allowed to remain until the 4th, 5th, or 6th day, as recommended and practised by Roux, the apertures left by them will be of such magnitude as almost to approach each other, and to weaken the parts so as to cause a separation on any untoward motion of the patient.

In the Gazette Medicale for August, 1842, a resumé has been given of the cases operated on by Roux, and the average success declared to be as follows. Of simple fissure of the palate, a success of two out of three. When complicated with fissure in the hard palate, one only out of three succeeds. In this latter class of cases Roux still continues the practice of cutting away the soft palate transversely from the palatine bones, and stretching the flaps across the chasm, always leaving in this way, as will at once be perceived, an aperture in the bones to be artificially covered. The operation also must frequently fail from the want of a free vascular connection between the flap and the surrounding textures.

By the method which has been proposed above, it has been already stated, that rejecting the first operation, in which the course directed by Roux was adopted, 13 out of 14 were followed by success, and the case which terminated unfortunately may perhaps be of sufficient interest to be related. I stated to this patient, before the operation, the possibility of a failure, owing to the great deficiency of soft parts. Notwithstanding the extreme tension after the operation, a union took place, and the flaps held together until the 7th day, when the adhesions were gradually destroyed; the inflammation of the throat during this time being great, and the sufferings of the patient from the sense of dragging at the sides of the throat and under the ears extreme. The patient, who supported this trying and protracted operation with the most manly fortitude, was partially repaid for his disappointment by a subsequent successful operation on the lip, where the teeth were exposed, and the mouth and nose communicated, from an operation which terminated unfortunately, having been performed when an infant.

In addition to these remarks on the treatment of congenital fissure of the hard and soft palate in the adult, it may not be amiss to consider what is the best plan to be pursued when we are called upon to advise upon the affection at the time of birth. At this early period, nothing of course can be done in the way of a surgical operation on the palate; much, however, may be effected by a judicious plan of treatment, to reduce and even close the aperture in the bones, and reduce the fissure of the soft palate to a simple state, and thus give the patient a better chance for recovering his voice as he advances in life. Our object may be effected in two ways: 1st, by the early operation of the hare lip, with which the fissure of the bones is generally complicated; 2d, by the use of mechanical means.

For some years I have been accustomed, even in cases of simple hare lip, to recommend the operation to be done earlier than is usually laid down by surgical writers, and lately, since the attention of the profession has been called to the subject by the excellent paper of Dr. Peirson, of Salem, have performed it as soon after birth as possible. The advantages of this early operation will be at once seen—the pins may be removed in 48 hours, and the child is able to nurse as soon as the mother is ready to receive it at the breast. If the palate is fissured the advantages are doubled, and it is surprising with what rapidity the edges of the bones are approximated when muscular action of the lips is brought to bear on them. It is also a question to determine whether the teeth would ever approximate if the hare lip was allowed to remain. In the case already stated above, in a patient 35 years old, the fissure had rather increased than diminished by time.

I shall terminate this paper by giving two cases in point. On the 15th Sept., 1841, I was requested by my friend, Dr. Shattuck, Jr., to see a child who had been born a day or two before with a hare lip and extensive fissure of the maxillary bone and palate. I advised an immediate operation, but in accordance with the wishes of the parents it was deferred for a week. The lip and the alæ nasi were extensively dissected from their adhesions on both sides the fissure, and being drawn together were confined by two pins. The prostomion was then accurately adjusted by a suture made on the inside of the mouth with a fine cambric needle. These were all removed by the third day. The mother was now directed to make a pressure on the maxillary bone with the thumb and forefinger when the child was lying asleep in her lap, and to have a spring made with pads at each ex-

tremity, somewhat similar to a double truss, which was to be kept on a part of every day, and by the lateral pressure on the jaw assist in obliterating the fissure. This has been done with so much effect, that at the present time nearly half of the aperture is destroyed, and the bones at some parts are nearly in contact.

I have lately operated on an infant, directed to me by Dr. Bowditch, with the same deformity as that just related.

The child was 48 hours old, and the operation immediately performed. The sutures were removed in two days, and the child placed to the breast a few days after. It is hoped that by pursuing the same plan as in the last case, the result will be as satisfactory.

In the foregoing remarks, I have omitted to allude, from want of space, to the various improvements in the way of instruments, &c., which have been added to the operation of staphaloraphy. A number of valuable papers have been written on the subject by surgeons of this country—by Drs. Warren, Hosack, Bush, and lately a very interesting communication from Dr. Mutter, of Philadelphia, who has described an ingenious operation of his own for closing apertures existing in the bony palate.

March, 1843.

Reviews.

I.—*The Gulstonian Lectures for MDCCCXLII. On the Mutual Relations of Anatomy, Physiology, Pathology and Therapeutics, and the Practice of Medicine.* By Marshall Hall, M.D., F. R. S. Lond. and Edin. &c. &c. Octavo. Pp. 86. London. Ballière, 1842.

If deep and practical interest in the subjects considered, a clear and vigorous style, in which every word is pregnant with meaning, no little originality in the views brought forward, and a pervading tone of real and earnest devotion to the cause of science, entitle a book to the consideration and favor of the public, this little volume will surely receive a hearty welcome amongst us.

The object of the book cannot be better given than in his own words. Having alluded to the prejudice so commonly entertained against the study of anatomy and physiology, on the part of the physician or the surgeon, as tending to lead him from *practical* views, he says, "My object is, if possible, to remove a prejudice so unfounded, so injurious to our science, and so unjust towards its ardent cultivators, by demonstrating that the physiologist alone can become the truly able practitioner; that *science* alone, properly pursued and applied, and not what has been fallaciously, and, I fear too often, insidiously, denominated *experience*, can lead to a just diagnosis, unfold the nature of disease, suggest new remedies, and guide us in the just employment of the old." How well he has succeeded in this attempt, can only be fully shown by a careful perusal of the book itself. Indeed, the whole is so intimately bound together, that justice cannot be done to its merits in a notice as brief as this. We can but glance at some of the most important topics, presenting them to the notice of the profession as subjects for farther investigation.

The book is in the form of three Lectures, on Physiology, Pathology, and Therapeutics. A classification in a tabular form is prefixed, beautifully exhibiting the author's peculiar views of physiology, but unfortunately too extensive for insertion here.

The first lecture on Physiology is devoted chiefly to Respiration and the Circulatory System. Adopting the opinion of Sir H. Davy, recently confirmed by M. Edwards, that respiration consists essentially in the absorption of oxygen, and the excretion of carbonic acid, Dr. Hall suggests the following momentous question: Which of these two functions is the more immediately important to life? His view of the subject is given briefly but clearly in these few words—"If we compare the duration of life when an animal is made to respire pure nitrogen or hydrogen, with its speedy extinction in the case of submersion or suspension, we can scarcely resist the conclusion, that the exhalation of carbonic acid is a far more immediately vital process than the absorption of oxygen; a conclusion which we certainly should not regard, in the first instance, as the most probable one."

And in general terms the function of egestion is more immediately essential to life than ingestion. "Privation of food may be sustained for several weeks; it is pure inanition; but suppression of urine, of bile, of the secretion of the fæces, is fatal in a much shorter space of time; the egerenda, if retained in the blood, proving, like the retained carbonic acid in the lungs, positive poisons to the vital organs." After the excretion of carbonic acid by the lungs, that of urine, by the kidneys, is the next most important office of egestion.

The beautiful application of the *Diffusion of Gases*, by Prof. Graham, to explain the phenomena of Respiration, is then given at some length; the substance of the matter is briefly this. It is evident that in ordinary respiration, the slight mechanical compression cannot empty the ultimate air-cells of their contents; not more than 20 cubic inches, or one-fifteenth of the contents of the lungs, are thrown out, from the application of a general pressure to the whole; and this portion is evidently that nearest the outlet, or the contents of the larger tubes. The bulk of the air is not altered during respiration, although, for a quantity of oxygen, carbonic acid is substituted. This substitution, which is the great end of respiration, takes place most abundantly in the minute air-cells; and the carbonic acid there produced must be moved along the smaller tubes by the diffusion process (viz., that property of gaseous bodies, by virtue of which the presence of one offers no obstacle to the complete diffusion of another), till it is thrown into the larger tubes, to be expelled by the ordinary action of respiration. But the action of diffusion—which is extremely energetic and also inevitable—is always two-fold; at

the same time that carbonic acid is being carried outwards from the air-cells, oxygen is carried inward in exchange, and the necessary circulation kept up through the whole lungs. Prof. Graham also applies this law of diffusion to explain the permanent inflation of the ultimate air-cells, which are known to be destitute of muscular fibre. The heavy carbonic acid is exchanged for a *larger* volume of oxygen, in the proportion of the diffusion volumes of the two gases; viz. 81 carbonic are replaced by 95 oxygen; thus there is a tendency to accumulation on the side originally occupied by the carbonic acid, and the air-cells are kept fully and permanently distended. Dr. Hall here starts the inquiry, by what addition of carbonic acid to the atmosphere, would the diffusion of this gas in the lungs, and its consequent exhalation from the blood, be entirely prevented? The question is of great interest in reference to asphyxia, induced by the charcoal fire and the "choke damp," and is well worth attention and experiment.

The circulatory system is treated of rather more fully, and some new and interesting views of its physiology are advanced, but we can only notice one or two of the most important. His remarks on the capillaries have much interest, but do not differ materially from those of Prof. Muller: the doubt expressed, as to "whether the true capillaries be really *vessels*, with distinct parietes, or only *canals*, formed in and by the other tissues," is, however, pretty much set at rest by Muller, in his "Elements of Physiology" (trans. by Dr. Baly, ed. 2, vol. i. p. 230), where his arguments amount to actual demonstration. The "remarkable fact, observed in the web of the frog, that minute nerves pursue a course close to the minute arteries" (which distribution is also observed in other tissues), is worthy of consideration, as tending to throw some light upon the immediate causes influencing the secretions, and the change of arterial into venous blood.

But his remarks upon the coronary circulation are of such extreme interest as to *demand* a more extended notice. And first, he asks, why are the two hearts conjoined together? The reason seems to have escaped physiologists. Mr. Mayo states expressly, that the two hearts, "for every purpose answered in the animal economy, might as well have been disunited." "But," says Dr. Hall, "there *is* a physiological reason, a physiological purpose, in this conjunction of the two hearts, of the utmost interest. The coronary arteries convey to the entire double heart, the stimulus of arterial blood. By its cir-

culation in this substance, it acquires, as in every other part of the system, the venous character. It is become a poison until its arterial character is renewed. How is it to be disposed of?

"Now if the two hearts were really planted separately in the animal frame, the *left* heart might be supplied by arterial blood; but the right heart could not receive arterial blood without a special distribution of vessels for this purpose. And, on the other hand, when the blood in the left heart had assumed a venous character, it could not, without a similar provision, be conveyed into the veins. Both these objects—the supply of arterial blood to both hearts, and the course of the venous blood from both hearts—are accomplished in the most beautiful, admirable, and simple manner, by the conjunction of both hearts together.

"But other objects are attained by this arrangement. In the first place, the power of the heart is, by means of the elasticity and reaction of the aortæ, impressed upon the coronary blood; the coronary arteries, capillaries and veins are distended; and the erection of all its tissues, its parietes, its columnæ carneæ, and its valves, and the diastole of its several cavities, are accomplished with the accuracy and at the very moment required. The very contractile force of the heart is thus applied for its own dilatation!

"The aorta, by its reaction, impresses upon the coronary blood precisely the force of the heart itself; so that the diastole of this organ may be said to be effected by a force equal to that of its systole; nay, by that very systole itself, though not acting so advantageously. The tissues of the heart are erected; the parietes are distended and separated; the columnæ carneæ, especially those attached to the valves, are elongated. The opposite phenomena take place when the interstitial and contained blood has excited the systole." Dr. Hall has observed actual facts analogous to those he has been supposing. On examining the circulation in the lung of the frog and toad, he has distinctly observed the organ to be elongated, its parietes separated, and its apex raised at each pulsation of the heart. This observation we have several times verified. "These remarkable effects," he continues, "are, doubtless, produced by the accurately proportionate and simultaneous supply of arterial blood to the coronary arteries of both auricles and both ventricles. Thus is the beautiful rhythm of the heart's action ensured. Had the two hearts been placed at a distance from each other, this regularity of its action would have been impaired by a variety of circumstances, of posture,

of muscular action," &c. Would not the fact, that the heart of cold-blooded animals continues to pulsate for some time after it is removed from the body, seem to render this of less importance than Dr. Hall supposes?

"In the last place, we may advert to the condition of the animal economy in the fœtus, and observe that the two hearts could not, in that period of life, have been separate; for it is essential to fœtal existence, that the two hearts should be conjoined in function as well as in position. In that early condition of existence, the lung is only supplied with arterial blood, like the other organs of the body. It would have been contrary to every principle in physiology for the whole of the blood of the system to have been sent through the lungs without object or purpose."

But passing over the rest of this lecture, which is full of valuable hints, we come to the subject of pathology. Where nothing is superfluous it is impossible to condense, and a single case, given at length, must stand as a sample of the whole lecture. It illustrates the effects of an interruption in the circulation at one point, upon the other portions of the circle.

"Mr. C——, aged 63, a barrister, called on me on the 10th of September, 1835. He had returned from the circuit, during which his friends had perceived his altered appearance. I was struck with his *breathlessness*, small, indistinct pulse, pallor, thinness, &c. I appointed to see him at home. On the next day I saw Mr. C—— at his own house. There were breathlessness on the slightest exertion, augmented impulse of the heart, without either distinct second sound or *bruit de scie*, slight *anasarca*, and slight *icterus*. The progress of the case was rapid. The breathlessness became urgent; there was a distinct rattle over the posterior right side of the thorax; the left ventricle beat rapidly, with considerable impulse, and without distinct second sound or bruit; there were some cough, distinct icterus, and augmented anasarca; the jugular veins were turgid; the pulse was small, irregular, indistinct. To these symptoms hæmoptysis succeeded. The only position which could be sustained was the erect. The cough became troublesome. The breathlessness, the rattle on the right posterior side of the thorax, the rapid, forcible beat of the heart, all the symptoms enumerated, continued, with occasional sickness. Gradually the cheeks became cool, the beat of the heart less forcible, the pulse less indistinct, the posture less raised; the extremities cold and clammy, and the patient sunk very slowly during several days.

"*Examination.*—The organs were examined 36 hours after death. There were slight icterus and anasarca. *The head* was not examined. *The thorax.*—The *left* cavity of the pleura contained one pint of sero-sanguineous fluid. The costal pleura was very vascular; there were no adhesions, except between two contiguous portions of the lung, and of this to the pericardium. The *right* cavity of the pleura was obliterated by adhesions. The *trachea* and bronchia were filled by frothy bloody mucus. The bronchial tubes were dilated, and their lining membrane redder than natural. Both lungs, but especially the right, were gorged with bloody fluid, so that only the upper portion gave the healthy crepitus on pressure between the fingers. A portion of the lower lobe of the *right* lung presented a circumscribed apoplexy of the size of an egg; similar but smaller apoplexies were found in the middle lobe, and in the upper lobe of the left lung. The two layers of pericardium adhered by means of coagulable lymph, which admitted of being readily torn and stripped off. This membrane was very vascular within; and, on its exterior surface, it was loaded with adeps and serum. The *heart* was considerably enlarged; the *right auricle* and ventricle were dilated and thickened; the auriculo-ventricular and pulmonary valves free from disease; the pulmonary arteries and their branches appeared enlarged; the *left auricle* was much dilated and hypertrophied; the auriculo-ventricular valve was very much thickened, of the firmness of cartilage, and admitted one finger only; the *left ventricle* was slightly enlarged and hypertrophied; the *aortic* valves were ossified, and rigidly immovable, and their orifice so contracted as not to admit the little finger.

"*The abdomen.*—The peritoneal cavity contained no fluid. The *liver* was small and its surface granulated. It was shown to Mr. Kiernan, who stated that it was in the second stage of hepatic-venous congestion. The gall-bladder was full of dark-colored bile; its ducts free. The peritoneum covering the intestines was deeply congested. The intestines themselves, from the middle of the jejunum to the rectum, were highly congested—the valvulæ conniventes being of a deep purple hue, and presenting numerous small patches of ecchymosis. The spleen, pancreas, kidney, &c., were healthy.

"These morbid structures are preserved in this bottle. They form a beautiful series, and they portray the true *pathology of the disease*—unlike the usual scraps of morbid anatomy which we find in our museums." (The appearances of the different organs are given

in a colored plate attached to the volume.) "The whole explains, too, what I would venture to designate the living pathology as distinguished from the morbid anatomy. It is impossible, in effect, that morbid appearances should follow in a more distinct order, or account more lucidly for the symptoms during life. I know of no case on record so illustrative of the effect of obstruction of the circulation, upon the *arriere* part of that circulation.

"The breathlessness is accounted for by the condition of the valves of the aorta and the left auriculo-ventricular valve. The smallness and indistinctness of the pulse by the former; the turgid jugulars by the impeded circulation, propagated from the lungs to the right side of the heart. The impeded flow of the blood through the aortic and mitral valves, led to congestion in the lungs, and this amounted to such a degree as became true 'apoplexie pulmonaire;' in consequence of this impeded circulation in the lungs, we have congestion of the hepatic vein in its second stage; as a further consequence of hepatic-venous congestion, we have congestion of the veins of the intestines, so remarkable on the post-mortem examination. The congested state of the liver led to the icterus, and to the hæmorrhagic state of the intestine. That of the vena cava to the anasarca." *****"These effects of an impeded flow of blood in one part of its double course should be borne in mind, if ever the aorta should be again tied."

One other interesting topic we must mention. Dr. Hall considers that the cases of sudden death arise, chiefly, from interruption of the coronary circulation! Ossification of the coronary arteries; a fatty condition of the heart; a dilated and feeble state of the left ventricle, &c., are causes producing this terrible result. His reasons for this opinion cannot be given here, but the investigation of the subject, as he has proposed, by arresting the coronary circulation by ligature, and the actual injection of substances into the coronary arteries, is in the power of any one.

The most important subject treated in the last lecture—on Therapeutics—is the action of poisons. Dr. Addison and Mr. Morgan have advocated the theory of nervous agency; Mr. Blake that of vascular agency exclusively. Dr. Hall is of the opinion, that, whilst *either* of these doctrines *alone* is inadequate to the explanation of the whole series of phenomena, both are absolutely required for this purpose. He divides all external agents into two classes:—

I. Those which act *physically*, and on the nervous system; and

II. Those which are *absorbed*, and act through the vascular system.

"The former act on the peripheral origins of the incident nerves of the true spinal and ganglionic systems: such as mechanical violence; chemical violence; the sudden impulse of light; heat; cold; galvanism, &c. The latter constitute the class of remedies and of poisons properly so called: these must pass into the state of solution, be absorbed, be carried along with the blood, &c. In both cases, the force of the agent may be finally exerted in the nervous centres." Dr. Hall details a series of experiments performed by himself in conjunction with Mr. H. Smith, similar to those of Sir B. Brodie, Wedemeyer, Emmert and others, tending to show that narcotic poisons, at least, act through the medium of the circulation; I may mention two of the most satisfactory.

"Ex. 4. We tied a ligature round the thigh of a frog, *excluding the sciatic nerve*, but so as to arrest the circulation; and we applied the strychnine to the web. In this case the spinal marrow was not divided, and sensation remained. Nevertheless, no tetanus took place in the space of a whole hour. We now removed the ligature; the circulation was speedily restored, and in five minutes the frog became tetanic.

"Ex. 5. We now divided the spinal marrow just below the cerebrum, so as to annihilate sensation, and we then divided all the tissues of the thigh, *excluding the femoral arteries and veins*, keeping these asunder at the distance of a line. The circulation was very perfect in the web. We applied the strychnine. In thirty minutes the animal became strongly tetanic!"

According to Prof. Muller, C. Viborg applied almost a drachm of concentrated prussic acid to the brain of a horse, laid bare by the means of a trephine, without the slightest symptoms of poisoning being produced. (See Lund, Vivisectionen, pp. 103, 104.)

The action of poisons through the medium of the circulation, upon the nervous centres, is sufficiently probable in the generality of cases; but how shall we account for the almost instantaneous action of prussic acid? The time required for it to enter the circulation through the medium of the capillaries, has been variously stated, at from half a minute to two minutes, but this violent poison proves fatal in a few seconds. Dr. Hall does not notice this fact. Prof. Muller supposes the acid to possess "great volatility and power of expansion, by which it is enabled to diffuse itself through the blood

more rapidly than that fluid circulates," but his explanation is far from satisfactory. The subject would well repay investigation.

As instances of Dr. Hall's first class of external agents, viz., those acting physically and on the nervous system, we might mention traumatic tetanus and hydrophobia. These diseases present phenomena similar to those produced by poisons, the difference being, that the former result from irritation, conveyed to the nervous centres through an incident nerve, whilst in the latter the circulation is the vehicle of transmission.

But there is no room for further comment. This brief notice is necessarily imperfect from the sketchy character of the book itself. But enough has perhaps been said to show the value of the book, and to furnish material for future thought and experiment.

Bibliographical Notices.

I.—*Bell's Select Medical Library. A Treatise on the Structure, Economy and Diseases of the Ear;* being the Essay for which the Fothergillian Gold Medal was awarded by the Medical Society of London. By Geo. Pilcher. First American from Second London Edition, with Notes.

The January number of this valuable reprint of foreign works, brings us the above Treatise, enriched with a number of illustrative Lithographs, forming an excellent monograph upon a subject upon which the profession at large need much light. The crowded state of our pages must be our excuse for denying it the full notice it deserves. The "Bulletin," hitherto published with the Library, will be published monthly and separately to subscribers, each number increased to thirty-six pages, the whole forming a large amount of matter for an exceedingly small sum.

II.—*The Diseases of Females, including those of Pregnancy and Childbed.* By Fleetwood Churchill, M.D., author of the Theory and Practice of Midwifery, Lecturer on Midwifery and Diseases of Women and Children in the Richmond Hospital School of Medicine, &c. &c. Second American Edition, with Notes by Robert Huston, M.D. Philadelphia: Lea and Blanchard. Pp. 575. 1843.

The second edition of the above work has just appeared from the press, greatly enhanced in value by the remarks appended by the American editor. Of all the works treating of these diseases, we have met with no one better adapted to the wants of the student. It embraces within a moderate compass a very wide extent of disease, giving the history and treatment with great conciseness, clearness and impartiality. It is hardly detailed and full enough to meet the wants of the practitioner, although by him it will be found convenient as a book of reference for authorities.

III.—*A Treatise on the Diseases of the Eye.* By Wm. Lawrence, F. R. S., Surgeon Extraordinary to the Queen, &c. From the last London Edition, with numerous additions and sixty-seven Illustrations, by Isaac Hays, M.D., Surgeon to the Will's Hospital, &c. Philadelphia. Lea & Blanchard. 1843.

The work of Mr. Lawrence has long since taken rank among the Classics upon its particular subject. The present work is a reprint of the edition of 1841, much revised and enlarged from the former, which appeared in 1833. The American editor, Dr. Hays, has made numerous and valuable additions; the whole making one of the best of works upon the subject.

IV.—*Treatise on the Dental Art, founded on actual experience,* illustrated by two hundred and forty Figures in Lithography, and fifty-four Wood Cuts. By F. Maury, Dentist of the Royal Polytechnic School. Translated from the French, with Notes and Additions, by I. B. Savier, Doctor of Dental Surgery. Philadelphia. Lea & Blanchard. 1843.

Maury has always sustained a distinguished reputation among the French school of dentists, and we cannot but augur well of the present translation. There appears to have been added much matter, and if our limits would have permitted, we should gladly have availed ourselves of the assistance of gentlemen especially conversant with this branch, to have given it a more extended notice.

V.—*Lectures on the Diseases of the Urinary Organs.* By Sir Benjamin C. Brodie, Bart., F.R.S., Sergeant Surgeon to the Queen. Philadelphia: Lea and Blanchard. 1843.

The present work bears on its title page, "from the third London editon, with alterations and additions," leaving a doubt in the mind of the reader whether he is to get merely the alterations and additions made to the *second* London edition, or is to find something taken from American practice and science. We have discovered, however, indications of no other hand than that of Sir Benjamin, whose reputation is sufficient to assure the reader that he will find a series of plain, practical and useful remarks upon the subject in question.

VI.—*A System of Practical Surgery.* By WILLIAM FERGUSSON, F.R.S. E. &c., with two hundred and forty-six Illustrations by Bagg, engraved by Gilbert. With Notes and additional Illustrations, by GEORGE W. NORRIS, M.D., Surgeon to the Pennsylvania Hospital. Philadelphia: Lea & Blanchard. 1843.

THIS work most completely supplies a want in English surgical books. It is essentially practical; in addition to what is given in a manual like that of Malgaigne, or other works of a similar character which have been translated, there is enough upon surgical disease to make it something more than the mere manual. It differs, though its merit is of the same order, from the work of Druitt, of which we had occasion to speak very favorably in a previous number, in that it relates more particularly to practice. Both books together will make a complete treatise, which should be in the hands of every student, and will materially assist every practitioner. The additions, by Dr. Norris, add much to the value of the work, being characterized by sound practical good sense, as is every thing we have seen from his pen.

NATIONAL INSTITUTE.

WE give an insertion to the following "Circular," recommending it to the attention of all under whose eye it may fall. Our limits forbid a more extended notice.

MEDICAL DEPARTMENT.—CIRCULAR.

Sir,—The National Institute, at its monthly session, on the 9th of January, 1843, instructed the officers of its Medical Department to issue a circular, inviting the attention of the corresponding and resident members, and other gentlemen who feel an interest in the advancement of medical science, to such facts as are connected with disease, health, and longevity, soliciting communications upon these subjects.

The undersigned, therefore, will feel obliged to you for any communications relating to these subjects, and especially for answers to the following inquiries:

1. What is the medical topography of your district or section of country, and have you any extensive sources of malaria?

2. What has been the effect of agriculture, the felling and clearing off the forests, the draining and cultivation of the soil, upon the climate, upon the health of the inhabitants, and upon the character of disease?

3. What manufactories are there in your district, and what is their effect upon the constitution and health of the operatives?

4. What epidemic and endemic diseases have occurred under your observation, or of which you can get a correct account from others?

5. What has been the character of the fevers of your district, what the cause, what the most successful mode of treatment, what the pathological changes found upon examination after death, and how far is there proof that they have under any circumstances been transmitted by contagion?

6. What change has taken place in the type of disease within a series of years in your district, and to what is such change to be ascribed?

7. What is the average duration or probability of human life in your population; has it increased within a number of years, and in what proportion, and from what causes?

8. What is the relative degree of health and longevity of the whites and blacks, the increase and mortality of each?

9. What is the relative degree of health, longevity, and increase of the slaves and free blacks; which suffers most from the influence of our epidemic diseases; and what are the causes which produce different results in these respects upon the two classes?

10. What is the annual number of marriages, births, and deaths, to each thousand of your population, and what is the proportion of male and female children born?

11. Have you any cases of great longevity; what have been the occupation and habits of such persons, and were they natives of your district or emigrants, and from what country and place?

12. Have you any persons who live exclusively upon a milk or vegetable diet, and what is the apparent effect of such diet upon the duration of life, the health, the strength, and activity of the body and mind?

13. What has been the effect of the temperance reformation upon the strength and health of your citizens?

14. The history of any interesting cases of disease which may have occurred under your observation, and especially in which the patho-

logy was ascertained by post-mortem examination, will be regarded as valuable. The discovery of new therapeutic agents, or the new application of old ones; also, meteorological observations, with whatever else illustrates the origin, progress, nature, and cure of diseases?

15. Pathological specimens of morbid structure, with an accompanying history of the origin, progress, and termination of the cases, will be highly acceptable. Such specimens will bear the name of the donor, and be placed in the National Museum.

16. As one object of the Institute is the formation of a Library, the undersigned will be obliged by the presentation of a copy of your own medical works or those of others, which it may be convenient for you to bestow.

All communications should be addressed to FRANCIS MARKOE, Jr., Esq., Corresponding Secretary of the National Institute.

THOMAS SEWALL, M.D.,
Chairman of the Medical Department.
JOHN M. THOMAS, M.D., *Vice Chairman.*
MARCUS BUCK, M.D., *Secretary.*
HARVEY LINDSLY, M.D., } *of the Committee.*
JAMES WYNNE, M.D., }

Washington City, D. C., January 12, 1843.

Scientific Intelligence.

EXTRACTS FROM THE REPORTS OF THE BOSTON SOCIETY FOR MEDICAL IMPROVEMENT.

Nov., 1842. Dr. John D. Fisher reported the following cases of disease following the dissection of a case of Puerperal Fever.

On the 23d of September, 1842, Dr. Whitney, of Newton, assisted in the post-mortem examination of a lady who died of puerperal fever. This lady was confined on the 18th of September of a child weighing 11 3-4 pounds. The labor was severe and protracted, and the placenta was taken away by force. On the 20th she exhibited some febrile symptoms, and on the 22d she died. The autopsy was made on the 23d, and the following pathological appearances were noticed.

The abdomen was enormously distended and tympanitic throughout. On laying open the abdomen, an excessively offensive odor escaped, and the intestines were found distended with gas. The peritoneum was inflamed, particularly in the cavity of the pelvis, to which region the inflammation was principally confined; and the cavity contained at least a quart of sero-purulent fluid, interspersed with flocculi. The uterus was very large and flabby; its neck being still nearly obliterated, and its mouth irregular and ragged. The right ovarium was in a state of commencing suppuration; the left was enlarged to the size of a common orange, and was filled with a tar-like fluid. The walls of the uterus were about half an inch in thickness, and its cavity was filled with a quantity of dark, grumous, thick liquid matter, which was sticky and offensive. The lining membrane of the organ did not exhibit any peculiar marks of inflammation. Dr. Fisher stated the above pathological appearances, as they were given to him by one of Dr. Whitney's students, and which are like those usually noticed in such cases. And he mentioned them here, as they are connected with the facts which he now proceeded to relate, and of which they were in one way or another the cause.

The dissection was performed by Dr. Noyes, of Needham, who was the physician of the deceased. Dr. Whitney assisted by holding the parts, and elevating the various organs, as well as in examining them and their contents. These offices he performed with his left hand alone, the right having a wound upon it; the former was therefore in immediate contact with most of the organs of the abdomen and pelvis, and was consequently

besmeared with the matter flowing from these organs. Mr. Hackett and Mr. Mason, students of Dr. Whitney, replaced the organs in the cavity of the abdomen, after the examination was completed, and sewed up the body. This autopsy, as before stated, was performed on the 23d of September, at 4, P. M.

While washing his hands after the operation, Dr. Whitney noticed that blood oozed from a small hang-nail which was on the thumb of his left hand. Of this, however, he took no thought until he noticed some inflammatory symptoms in this arm.

On the 24th, he attended to his business, and visited Boston in the afternoon. During his ride home he experienced severe chills, and in the evening made use of means to promote the perspiration, but still the chills continued. Upon taking off his coat, he experienced a sensation of soreness on the middle of the dorsum of the fore-arm, occupying a space of the size of a crown. The spot was red, and tender to the touch, but not elevated; supposing it to be the commencement of a common boil, he took no further notice of it at that time. Through the night he continued chilly.

In the morning of the next day, Sept. 25th, he felt better than on the night previous; his arm being more sore, however, than before. During the forenoon he attended to his business, and in the afternoon went to church. The arm pained him somewhat during the day, and was more inflamed, so much so as in the evening to induce him to examine it attentively. He now discovered red lines extending along the inner side of the arm towards the axilla. The left axillary gland was tender to the touch. Through the night he suffered intense pain in the whole of the arm, and severe chills; did not sleep.

On the morning of Sept. 26th, he felt faint upon rising, and on going down stairs he fainted. The left fore-arm was now very much swollen, an erysipelatous inflammation, extending over its inner surface, from the wrist to the elbow-joint; pain and soreness were experienced along the course of the lymphatic vessels of the humerus, as far as the axilla. The axillary gland was more tender, sore and swollen; the head was intensely hot, face flushed, headache severe, and the pulse 100 in a minute. It was at this period that Dr. Whitney suspected the cause of his illness, and supposed that his system had imbibed poison from the subject whose autopsy he had assisted in making three days previously; he therefore immediately sent for Dr. Spaulding, his father-in-law. A cathartic was now given; leeches were applied to the arm, followed by poultices wet with a solution of sugar of lead; and after a few hours a blister was applied on the humerus, just above the elbow-joint. In the evening a considerable hemorrhage from the nose took place; a poultice with

laudanum was applied to the arm, to relieve the severe pain. During the night, the febrile symptoms, pain in the arm and head were so severe, that sleep was impossible even by the aid of morphine.

In the morning of Tuesday, Sept. 27th, the arm was still more swollen, and so sore and painful that he could not suffer it to be moved or touched. The inflammation had now extended above the elbow, half way up the humerus. The tongue was coated and dry, thirst great, pulse 95 to 100, bowels confined. During the day he complained of a deep-seated soreness in the chest, and also an acute pain in the region of the liver. The antiphlogistic and cathartic treatment was continued, a blister was applied round the upper portion of the humerus to arrest the extension of the inflammation upwards; and a large one was excited over the liver to relieve the intense pain experienced in this region. The arm was dressed with cloths moistened by a solution of the acetate of lead, and poultices.

The night was passed more comfortably, and in the morning of Wednesday, Sept. 28th, he expressed himself as feeling a little better. On this day, Dr. Fisher was requested to visit him, and gives the following account of the patient. He found him lying on his back in bed, his head elevated, and his left arm resting on a pillow at his side; face flushed; skin hot; pulse 100, full, hard, and slightly rebounding; respiration hurried. The left arm was inflamed and swollen from the wrist to the point of insertion of the deltoid muscle, the fore-arm being at least double its natural size. Two bluish spots of the size of a dime existed on the inner face of the fore-arm, one opposite the ulna, two inches below the elbow-joint, the other between the radius and ulna near the middle of the arm. Dr. Whitney complained of great tenderness and soreness in the diseased arm, and was unable to move it of himself, saying that it appeared as if it were a leaden member attached to him, possessing unusual sensibility. He complained of soreness in the axilla, and also in the thorax, particularly along the sternum; also in the region of the liver, over which a blister had been applied and was still open; in the groins, particularly the left one; and in the left testicle. "In fact," said he, "it seems to me that every gland in my body is sore, painful, and swollen." The pain and deep-seated soreness in the region of the liver were particularly referred to, and pressure in this part was intolerable. Gentle pressing on the left axillary and inguinal glands and testicle gave much pain. The tongue was coated in the middle, highly red at its borders, and dry. Thirst urgent. Bowels rather inactive and costive. Abdomen tumid and tympanitic, urine high colored. One of the marked symptoms attended the respiration. This was hurried, irregular, and accompanied by the feeling of oppression, and occasionally by hiccough. The lungs appeared to be healthy, and to admit the air freely; but the function of respiration seemed to be performed with labor,

and in an imperfect manner. The free admission of external air into the room by the windows was constantly demanded; it gave, however, only partial relief. The antiphlogistic treatment was still continued, poultices were constantly applied to the arm, fomentations ordered to the abdomen, and cathartic medicines to be given. A blister was placed around the arm, above the point to which the inflammation had extended.

On the morning of Thursday, Sept. 29th, it was reported to Dr. F. that the patient had passed rather a comfortable night, but was at times somewhat delirious. The medicine had produced its desired operation, and the blister had drawn well. The general symptoms were nearly the same, pulse 94. The arm presented the same appearances as on the day previous, save that it now exhibited a smooth, shining surface, as if the integuments were distended to their utmost extent. The inflammation had not extended beyond the blister, which evidently had arrested its progress upwards; it had, however, invaded the dorsum of the hand. The patient still complained of great soreness in the glandular system; the soreness in the region of the liver was, however, partially relieved by the blister which had been applied. During the afternoon the febrile symptoms increased; and in the evening, feeling nausea, with a sensation of weight at the stomach, Dr. W. took, of his own accord, an emetic, which operated rather powerfully, and with relief. The night was passed with much restlessness and delirium.

The febrile action on the next day, Sept. 30th, was much less, pulse 80, and symptoms of prostration were apparent. The arm had lost something of its intense redness and sensibility, and the process of suppuration had evidently commenced in it. The patient had no power over the arm; his brain seemed to be inactive, and mental operations sluggish. All active treatment was now abandoned for one that was tonic and stimulating; quinine and wine were now freely administered. This course was considered to be demanded, notwithstanding the tongue was red, dry, and thickly coated. The poultices were still continued to the arm.

Oct. 1st. The symptoms of prostration were alarming; the patient presenting the general phenomena which characterize typhus fever in its grave form. The arm was less painful, but more swollen, and pus was evidently formed and accumulating beneath the integuments of the forearm near the elbow. The treatment with wine, quinine and poultices was continued. During the day and subsequent night the prostration seemed to increase, and the patient was delirious during the latter, so that fears were entertained by his friends that he would not survive till morning.

On visiting him the next day, Oct. 2d, Dr. F. found that the fears of his friends were not without foundation. Symptoms of extreme prostration of the vital powers were evident in all the organs. The features were

shrunken and bedewed with a clammy sweat, the respiration was labored, the action of the heart was feeble and rapid, the brain was oppressed, so that the patient was unable to comprehend questions put to him, or to articulate answers. The tongue was dry, stiff and hard, and deglutition was somewhat difficult. The bowels were swollen and inactive, and fluids when passing into the stomach were attended with a metallic tinkling, like that produced by agitating water in a thin glass flask or bottle. The arm had assumed a leaden hue, and matter fluctuated in two places on the fore-arm, corresponding to the bluish or gangrenous spots, which were early noticed as being situated, one near the elbow, the other in the middle of the arm. The stimulating and tonic treatment was continued; brandy, wine, quinine and ammonia were freely given, and stimulating injections were ordered in aid of the tonics given internally. In the after part of the day and during the night the powers of the system seemed to rally; and matter began to flow from the arm at the two points where it had accumulated.

The next day, Oct. 3d, the powers of the system remained about the same, and the discharge from the arm was free and promoted by poultices. Broth and beef-tea were now added to the stimulating and tonic treatment, notwithstanding the state of the tongue and digestive organs seemed to forbid their use. From this period to that of convalescence and recovery, the history of the patient is quickly told.

For about a week it seemed doubtful whether the powers of the system would hold out, supported as they were by the free use of brandy, wine, quinine, and animal diet. At the end of this period, however, a favorable change was apparent. The tongue began to clean, the natural appetite to return, the bowels to act, and the pulse and strength to improve. The discharge from the arm continued freely from the two openings, and sloughing commenced from three or four small points on the opposite side, or dorsum, of the arm. The cuticle of the fore-arm was raised for a considerable extent, and came off with the poultice.

The patient during all this time had not been moved from his bed, and was most of the time unconscious of what had been going on. He was now, Oct. 10th, so prostrated that he could not move himself in bed, and had no power over his diseased arm. The same course of treatment was persevered in, and on the 20th of October the patient had so much improved in his strength that he was placed in a chair. The discharge from the arm still continued.

By the 1st of November he was able to take the air, and on the 14th to ride to Boston. His arm has ceased to discharge matter, and is reduced to less than its natural size; he is still unable to use it, or to move his fingers.

During the period of his greatest prostration, Dr. Whitney drank daily a quart of wine, and from a gill to half a pint of brandy, and took from 12 to 20 grains of quinine.

Case II. That of Mr. Hackett, a medical student.

As has been stated, Mr. Hackett assisted in sewing up the body from which Dr. Whitney appears to have imbibed poison. Mr. H. had two small wounds of the size of a pea on a finger of his left hand, caused by a burn. These wounds were covered by hard scabs, and were considered to be nearly healed. On the 25th of September, three days after the autopsy was made, Mr. H. experienced chills, febrile symptoms, and a soreness in his left arm. On the 26th, 27th, and 28th, these symptoms increased, particularly the soreness and pain in the left hand and arm, but they did not confine him to the house. On the 29th, he felt so unwell, and suffered so severely from constitutional disturbance and pain in the arm, that he took to his bed; and on the 30th called in Dr. Spaulding, who discovered in him the same constitutional symptoms which characterized the case of Dr. Whitney, and reports that although the left arm was the seat of pain and tenderness, yet it was not swollen or inflamed; that the gland of the axilla was tender and painful, and that the patient complained of general soreness in the whole left side of the body, and manifested great nervous and vascular excitement. An emetico-cathartic was administered, and other remedies ordered for the purpose of relieving the symptoms. On the 2d of October, Dr. Fisher saw the patient, and found him to be laboring under the symptoms just related. The pulse was rapid, rebounding, rather hard, and the brain and nervous system highly excited. The patient complained mostly of pain and soreness in the left side of the body, had but little power over his left arm, and could not turn himself in bed, from want, as he stated, of power in left half of his body. The integuments and lymphatic glands and vessels of the left side were tender to the touch, and a deep-seated soreness, corresponding to the distribution of the glandular system in the left thorax, was complained of. During the two succeeding days the symptoms did not vary much. On the next day the disease seemed to have arrived to its greatest degree of activity. The patient was delirious, and the integuments of the left side, particularly from the axilla to the pelvis, assumed the appearance of erysipelas, and were somewhat swollen, hard and painful to the touch. In the course of this day the strength and vital powers began to give way, and on the next, October 6, the prostration was very great, attended by almost constant delirium. During the night a general tumefaction of the whole body was noticed, and before morning the bowels became much swollen. This swelling of the body continued to increase during the next day, Oct. 7, and by 4 o'clock, P. M., when Dr. F. saw him for the last time, the bowels had become enormously dis-

tended, the whole body and limbs greatly tumefied, and the cutaneous surface had assumed in every part a bluish mottled appearance. The patient was then in a dying state, and in two hours expired.

In conclusion, it should be observed, that Dr. Noyes and Mr. Mason, both of whom assisted in the autopsy, have experienced no trouble. Neither of them had any wound in the hands.

The two cases now reported present a number of interesting points.

1. They confirm previous observation respecting the danger which attends the autopsy of one dead of puerperal fever, and prove that the body examined must have yielded a most virulent poison.

2. That this poison may be absorbed into the system through the medium of small wounds, such as small, unnoticed hang-nails, and dry scabs covering burns.

3. That it is not absorbed into the system through the medium of a healthy and sound skin, or of the lungs during respiration.

4. That the poison seeks and spends itself primarily on the glandular system.

5. That the system may be affected by the poison both constitutionally and locally, as in the case of Dr. Whitney; or constitutionally only, as in the case of Mr. Hackett.

6. That the disease induced has its period of excitement and prostration.

7. That when the poison occasions a local inflammation, resulting in suppuration and a discharge of matter, the vascular excitement is modified and the chance of recovery increased.

Nov. 28th, 1842. Dr. Henry G. Clark reported the following case of premature induction of labor without rupture of the membranes.

Mrs. S., æt. 30, from St. John, N. B., consulted me in May last; she was pregnant with her sixth child, and had always great difficulty in labor, only one of the five having been born alive, and that at 7 months, a female, now living, and 10 years of age.

I had myself attended in her fourth confinement in 1837. I then found her to have a pelvis contracted in its conjugate diameter to less than 3 inches, by the projection of the promontory of the sacrum. She is short, of awkward figure, and has also lateral curvature of the spine. It became necessary to resort to perforation of the head at that time—delivery being otherwise impossible.

At her last confinement, two and a half years since, she went to her native town, where, she informs me, it was thought proper by her attendants there, after three days sickness, to have recourse to the same measures. She did not recover from this for some months.

It seemed to me that this was a proper case for the induction of premature labor. I therefore proposed it to her as the safest course for herself—

as the only one for the child. She readily consented to submit to this or any other procedure which might be deemed necessary.

Nov. 22d. Dr. Townsend saw her this day in consultation, and confirmed my opinion.

I proposed to myself the following method, viz. 1st, to remove the viscid mucus which is found about the cervix uteri, and to dilate and irritate the parts moderately by the fingers, at certain intervals, until some effect should be produced. In addition, if this should not be sufficient to bring on the first stage of labor, to use the ointment of belladonna, and 2dly, as soon as this should be accomplished, to exhibit, at regular periods, small doses of ergot to *excite* natural uterine action.

The last menstrual period was passed March 25th, so that she had now progressed nearly eight months.

This morning, ordered a brisk cathartic. In the evening I called again and made an examination. The finger was insinuated into the os uteri, and the secretions thoroughly removed. Considerable pain was excited by this operation, which continued at intervals for an hour, and then ceased.

Nov. 23d, 9 A. M. Patient slept well all night, and has no pain to-day. Upon examination, the os uteri was found to be more relaxed than last night, and readily admitted two fingers to be passed to the membranes. They were retained there, and the dilatation persevered in for 15 or 20 minutes. By this manipulation, two or three slight but distinct propulsive pains were produced. Pain continued after this more or less for three hours, but with no further bearing down. 10 P. M., os uteri more dilatable, and accompanied with some shortening of the cervix. Membranes easily felt, and, by the ballottement, what I suppose to be the head of the child.

The dilatation now seemed to be sufficient to warrant the exhibition of the ergot—ten grains were accordingly given in decoction.

24th. Patient reports violent pains in the back, loins and hips all night. None in abdomen. These pains have now abated and she is quite easy. Dilatation increased a little. Directed her to rest until 2 o'clock, and then to take 5 grains of ergot, and to repeat the same dose at 5 P. M. Regular propulsive pains came on at 6 o'clock, and continued until the labor was safely accomplished at 1 A. M. The infant was a lively boy, weighing 6½ lbs. The waters were not discharged until a little after midnight. The head, notwithstanding its small size, and in spite of remarkably strong pains, was firmly lodged in the narrowed upper strait for an hour and a half after the os uteri was well dilated, and showed marks of severe treatment during its passage. It was not at all ergotized.

Dec. Mother and child well.

In this case I believe either of the methods usually practised would have been unsuccessful. If the membranes had been ruptured at first, the head

would have fallen early into the upper strait, and the child fallen a victim to its fatal compression there.

If ergot alone had been given, either the object would not have been accomplished, or some grievous injury might have been inflicted on the mother. It is a very good rule in natural labor, "not to give ergot until the os uteri is well dilated." How much more should it be observed in these cases where *no* effort of nature has been made, and where labor has not even commenced!

At any rate, the method adopted in this instance seemed to produce results nearly allied to those produced by nature herself, in carrying forward the same operation at the full period.

Dec. 26, 1842. Dr. D. Humphreys Storer reported the following case of retained placenta, followed by perforation of the uterus.

Cases in which the placenta is retained in the uterus for *several hours* after natural labor are of common occurrence, and few physicians can be found with an extensive practice who have not repeatedly met with cases where *days* have passed without the secundines being expelled. A great number of instances have been enumerated in the journals during the last few years, to show that the constitution does not *necessarily suffer* by their not being removed; that they are eventually thrown off in fragments, which gradually separate from the mass; or are preserved by the injections thrown into the uterus, and come away entire; or are absorbed; or are even retained until a succeeding pregnancy, and follow the placenta of that fœtus. So often are these cases met with in our *studies*, that we might allow them to quiet our anxieties in *practice*, did we not occasionally encounter cases, which, with all our attention and effort, aided by the advice of our brethren, cannot be successfully managed. Some of the members of the Society may recollect that a year or two since I reported a case of *tetanus* following a retained placenta. In that case there was not the slightest symptom of *peritonitis* nor *metritis*, so far as could be discovered without a *post-mortem examination*.

Since the last meeting of this Society I have met with another case terminating fatally, dependent upon a retained placenta. In this case there was well marked *puerperal peritonitis*. As the *history* was interesting to me, and the post-mortem appearances were different from those presented in any case I have been able to find recorded, I will concisely relate them.

On the 7th instant, at 5, A. M., Mrs. G., aged 21 years, after a labor of a few hours, was delivered of her first child. It was very small, and I should judge not to be more than eight months grown.

The uterus contracted well, but the placenta not being readily detached, I examined and found it firmly adherent, high up, to the uterus. After

waiting several hours for its expulsion, I made an unsuccessful attempt to remove it by the hand. A small portion only was brought away. During the evening of the first day, my patient was seen by another practitioner, who also attempted to remove the placenta, with no greater success than myself, he being able to remove only a small portion, of the size perhaps of an *olive*. For the three first days my patient's symptoms caused me no alarm. During this period I administered 3 i. of ergot, in divided doses, and gave a cathartic of castor-oil. The lochia appeared, and continued to flow, and her breasts secreted milk. No pain nor difficulty was complained of—and although I visited my patient morning, noon, and evening, of each day, it was with the hope of learning that the placenta had been thrown off, and not with the expectation of finding her more sick.

On the morning of the 10th inst., the commencement of the fourth day, I found the *pulse* had risen from 84 (which they were at 10 o'clock the previous evening) to 140. The *abdomen* was tympanitic, and pressure upon it produced considerable uneasiness; while *distinct pain* was caused in the uterus by the application of external force. The lochia and milk had disappeared, the respiration was hurried, and the countenance was distressed.

Here was *peritonitis*—but how should I proceed? As in ordinary cases of this disease? What would be gained by *general bleeding?* The irritating cause would still be in the uterus, however much temporary benefit might be produced. I was unwilling to act alone—and Dr. Channing, in a few moments after my morning visit, saw my patient with me. He examined the uterus, but could remove nothing. After carefully investigating the case, he suggested the application of 10 leeches over the region of the uterus, a hot Indian poultice to the remainder of the abdomen, and the continuance of injections of chloride of soda, which had been previously used, into the vagina. She seemed relieved during the afternoon—a Dover's powder was exhibited at night. In the morning she was decidedly better; the abdomen was less affected by pressure, and was less swollen; the pulse had fallen to 100; she had slept and perspired freely during the night. At noon of this, the 5th day, she was still more relieved, and could I have forgotten that the placenta was still in the uterus, I should really have felt that my patient would yet do well. In the afternoon of this day her pain gradually returned, and during the night it was mitigated only by opium. On the morning of the 6th day I found her in the greatest distress; the pain was intense. The tympanitis had greatly increased, and the respiration was labored. During the whole forenoon of this day she suffered from constantly returning pains, after a longer or shorter intermission, which increased in their severity until they could scarcely be borne. These pains might readily be mistaken by a by-stander for labor pains. In the

afternoon of this day her pains suddenly ceased, and did not again return; the distension of the abdomen increased, the respiration became more labored, the pulse rose to 160, and she died the next evening.

Upon examining the body after death, the fundus of the uterus was found to be in a state of ulceration, and projecting through it into the abdominal cavity, was seen a large portion of the placenta—the remainder still being contained within the cavity of the uterus. The body and neck of the uterus were not disorganized.

The results of the two cases I have repeated to this Society show how great are the dangers to be feared from a retained placenta. In both cases I followed the advice of Blundell, and the dictates of my common sense—"to leave the placenta in the uterine cavity if it could not be removed without the risk of bruising or lacerating the uterus: not because it is not an evil to leave it there, but because to leave it in the uterus is a smaller evil than to abstract it with violence, and we had better abide by the smaller evil than expose ourselves to the greater evil, that of lacerating, bruising and killing."

And in both cases the results were peculiar, and I feel could not have been averted.

In the former case *tetanus* ensued.

In the latter case, after the placenta had been retained for three days, attached to the fundus of the uterus, inflammation commenced—the parietes of the fundus became disorganized, and (probably on the 6th day) during a succession of severe uterine pains, gave way, and the placenta was partially protruded through them into the abdomen.

Feb. 13th, 1843. *Painful Crepitation of the Tendons.*—Dr. J. Mason Warren stated that he had lately met with an affection which he had not seen described in any of the English surgical works; it has been treated of by Velpeau under the name of "Crepitation douleureuse des tendons," and is a disease of some practical interest. The case was as follows. The patient was engaged in arranging some window curtains. While standing on the top of a flight of steps, from a sudden jerk her foot slipped, and the hand was caught in the curtain-rod, flexing very powerfully the wrist with the whole weight of the body bearing on it. At the instant she felt a slight snap on the lower and back part of the arm near the wrist. This was followed by considerable pain and swelling, and she was supposed to have met with a fracture of the radius. Dr. W. saw her the day following. At this time the following appearances presented. On the back part of the arm, just over the head of the radius, was a small swelling, a little red and painful on pressure. By placing the finger on the prominence and flexing the hand, a distinct crepitus was perceived, which at first might be taken

for the grating of bone, but on a little examination was at once perceived to be quite different, being a more dry and distinct sound, somewhat similar to the rubbing together of coarse brown paper, and compared by M. Velpeau to the sound which we hear from the rubbing together of inflamed serous membrane, the pleura for instance. The sensation is at first quite startling, and is distinctly perceived by the patient, and when once discriminated by the surgeon, is not easily to be forgotten. In the present case the greatest crepitus was heard, and the most pain caused to the patient, when the thumb was flexed.

A number of explanations have been offered as to the cause of the crepitus. The most reasonable, and undoubtedly the true one, is that of Velpeau, which is the friction of the tendon against the dry synovial sheath, its fluid being absorbed by the inflammation consequent on the injury. Somewhat a similar grating sound is often perceived by moving the patella in a certain stage of synovial inflammation of the knee joint.

The disease is most frequently found in persons whose occupation produces a great strain on the joints, such as blacksmiths, stone-cutters—also in washerwomen it is caused by twisting the clothes. It occurs in the ankle as well as in the wrist joints. The disease yields to treatment in abont 10 or 14 days, as in the present case—no pain or crepitation being perceptible after a fortnight.

Osteo-Sarcoma of Lower Jaw.—Dr. J. Mason Warren exhibited a tumor of the lower jaw bone which he had removed a day or two before. The history of the case was as follows.

The patient was a young man, 24 years old, a seaman, and of a healthy constitution. Thirty months since, without any appreciable cause, a small hard tumor made its appearance on the lower side of the angle of the jaw of the left side. This tumor gradually increased, extending itself equally in every direction. At the time of the operation the tumor was the size of an egg, comprising that part of the jaw situated between the angle and the second incisor tooth, and extending half way up the ramus of the jaw. The operation was performed by making a semicircular incision from over the condyloid process to the middle of the symphysis—joined by a descending incision from the lip. The flap was now dissected up, the jaw partly sawed through before and behind, and the division completed with the cutting forceps. The tumor was then dissected out, the masseter being divided at the height of the division of the bone. The inferior maxillary artery, the facial, and an artery of the flap, required ligatures. After waiting some time for the leakage of blood to cease, the lips of the wound were brought together by a number of sutures, and the patient being a little faint, was placed in a horizontal position. In the course of about 15

minutes, a stream of blood was found to be issuing from the mouth. The wound was immediately opened, and a most serious hemorrhage commenced—the blood appearing to issue in jets from almost every part of the wound, and as fast as one artery was tied, another of considerable size required a ligature. About 20 ligatures were applied before the hemorrhage was arrested. The wound was again brought together, and the patient is now doing well.

The tumor removed was about the size of an egg, its parietes elastic, and on being cut into, were found to be about two lines in thickness. The cancellated structure of the bone was much hypertrophied, and filled with small reddish granulated bodies, presenting that semi-malignant appearance often seen before the disease has broken through its bounds and implicated the surrounding soft parts. In the present instance the adjacent structures were perfectly healthy.

Extracts from Foreign and American Journals.

ANATOMY AND PHYSIOLOGY.

On the Composition of Fibrin.—The following conclusions are drawn by M. Bouchardat from some important experiments:

"1st. Fibrin, when separated from fatty matter, is composed of three proximate principles in variable proportions;—a substance identical with pure non-coagulated albumen, for which I propose the name of *albuminose:* this fluid albumen is imprisoned in a network of a tisue composed of *gelatine*, and of a principle possessing all the properties of the epidermic formation, for which, on this account, I propose the name of *epidermose.*

"2d. The fundamental principle which we find in the albumen of the egg, in the serum of the blood, in the gluten of the cerealia, and in the caseum of milk, is always identical; it is albuminose mixed or combined, sometimes with earthy matter, as phosphate of lime and magnesia; sometimes with alkaline salts; sometimes with fatty matters; which extraneous substances mask its essential properties. When, by the operation of an almost unappreciable portion of acid, we have destroyed this transient combination, the solution of albuminose possesses identical properties, exerting precisely the same chemical reactions, having the same influence on polarized light, and possessing an energy (other things being equal), exactly proportionate to the quantity of the substance dissolved."

This last statement may, we believe, be accepted with truth; since it bears a very close correspondence with the results of the analogous experiments of Mulden and other German analytical chemists. And with respect to the former, we do not see any ground for hesitating to accept the conclusion of M. Bouchardat, that gelatine exists in small quantities in the blood; and that its amount is much increased in certain pathological conditions. That gelatine exists in the blood has always been considered probable; especially since our increased knowledge of the chemical relations subsisting between gelatine, fibrin, albumen, &c., has made it almost certain that the gelatine derived from the food cannot be converted into an albuminous or fibrinous tissue, but can only be employed for the nutrition of the gelatinous tissues. (See Vol. XIV. p. 510.) That a substance resembling the horny matter of the epidermic tissues, also, should exist in the blood, appears quite consistent with our previous views; since the elaboration of this matter, like that of fat, may be regarded as holding a middle place between the functions of nutrition and secretion, and as probably taking place in the blood during its circulation. By a reference to the comparative table of the constitution of the different proximate principles, which we extracted in our last volume (p. 513), from Liebig's work, it will be seen that the epidermic substance does not depart so widely as gelatine from the composition of fibrin, albumen, &c.; so that its elaboration from them may be a very simple process.

We can by no means assent, however, to the view of the nature of fibrin

which M. Bouchardat seems desirous of founding upon these experiments, namely, that in the clot of blood there is a network composed of gelatine and epidermose, imprisoning fluid albuminose. It is to be remembered that most of his experiments on this subject were made on the buffy coat; and these cannot be regarded as affording sufficient ground for such a conclusion in regard to the ordinary crassamentum. We have always held that fibrin differs from albumen more in its *vital* properties than in its purely chemical relations; and we see no reason to alter our opinion. Fibrin we believe to be albumen in process of organization; that process is continually taking place in the living body; and the constant withdrawal of the fibrin for the nutrition of the tissues is compensated by a conversion of fresh albumen into fibrin. The process is seen distinctly in the gradual organization of coagulable lymph; and the ordinary coagulation of the blood appears to us a step in the same process, which does not go further because the blood is not in contact with a living surface. A precisely analogous series of gradations is noticeable in plants, where *gum* answers to the *albumen* of animals; whilst the *fibrin* is represented by the peculiar glutinous substance contained in the elaborated sap, which is evidently the pabulum from which the old tissues are nourished, and the new ones formed. To deny the distinct existence of fibrin, as such (which M. Bouchardat seems inclined to do), is just as unphilosophical as it would be to deny the existence of muscular fibre as a distinct substance, because, in its purely chemical relations, it may correspond with the albumen of the egg, or the gluten of wheat. Moreover, there is a total absence of proof that anything like the gelatinous or epidermoid tissue, described by M. Bouchardat, really exists in the blood; on the contrary, we believe it to be yet undetermined whether gelatine is ever organized at all, or whether both it and the epidermic substance are not deposited in cells composed of fibrinous tissue, as fatty matter is well known to be. Further, it is well known (especially through the inquiries of Mr. Gulliver) that the fibrinous clot is hardened by long boiling, and that the fibrous appearance it presents becomes more distinct; precisely the reverse would be the case, if the areolar tissue were composed, even in part, of gelatine. In what relative condition the three principles,—namely, the true fibrin, the gelatine, and the epidermose,—exist in the crassamentum, remains a subject for future inquiry, in which microscopical and chemical investigations must go hand in hand. The great increase of gelatine in the blood, during inflammation of the gelatinous tissues, and the corresponding increase of the colorless corpuscles, naturally suggests the idea that the two phenomena may be in some degree related.—*Br. & For. Med. Rev. from Comptes Rendues*, 1842.

PATHOLOGY, PRACTICAL MEDICINE AND THERAPEUTICS.

Account of a Disease which affected a large number of Persons in the Canton Zurich, and which was induced by partaking of Decayed Meat. By Dr. Sigg.—On June 10th, 1839, a musical festival was held in the church at Andelfingen, to which persons resorted from all parts of the canton. In the church the air was extremely hot, and the atmosphere out of doors was oppressive, and the clouds were heavy, and threatened a thunder

storm. After spending four hours in the church, between 500 and 600 persons sat down in an outhouse, which had been fitted up for the occasion, to a dinner of cold veal, ham, and salad, with indifferent wine and beer. The meat did not look good, and the ham had such a strong taste that many persons did not partake of it, though most made a hearty meal.

On their way home many were taken ill and vomited; on the following day many more were attacked with nausea, vomiting, and diarrhœa, and within a week or ten days, most who had borne a part in the festival became more or less seriously indisposed. Of the 600 persons who had partaken of the dinner, 444, or more than two-thirds, were attacked between the 10th and 20th of June, of whom nine died with typhoid symptoms.

Those persons who had vomited on their way home from the festival, suffered but little subsequent inconvenience; the others were mostly seized from the 5th to the 10th day after it, with sense of uneasiness and exhaustion, with pains in the limbs and head, slight rigor, loss of appetite, with great thirst, and an extremely unpleasant coppery taste in the mouth. Nausea, with vomiting and diarrhœa, were extremely common, and notwithstanding their sense of exhaustion, the patients were unable to sleep, but walked listlessly about, or threw themselves on the ground to rest.

After these symptoms had lasted about seven days, they increased in severity; the fever ran higher, the pains in the head were more distressing, and the patients were compelled to keep their bed. Colic-pains came on in the abdomen, and the epigastric region was frequently extremely tender. At this stage of the disease constipation usually existed, but sometimes diarrhœa came on, in which the patients passed six or eight dark green and highly offensive evacuations in the twenty-four hours, by which they were greatly exhausted. Delirium often accompanied the evening exacerbations of fever, during which the patients were extremely restless, and often violent, but about the 12th day they usually sank into a torpid state with predominance of the typhoid symptoms, while it was only on touching the abdomen that they seemed to be suffering pain. Symptoms of oppression at the chest generally supervened from the 14th to the 17th day, and were attended with cough and slight expectoration. This occurrence seemed to mark the third stage of the disease, and was usually accompanied with the gradual subsidence of the abdominal symptoms. Moisture appeared at the edges of the tongue, the skin began to perspire, and the patients gradually advanced towards convalescence. No discharge occurred which could be called critical, but the cough and fever usually subsided together, leaving the patient in a state of great weakness. In the cases which terminated fatally, the typhoid symptoms of the second stage increased in severity, the abdomen became tympanitic, the stools were horribly offensive, and often mixed with blood, the weakness of the patient became extreme, and fainting-fits were frequent, till death at length took place.

A post-mortem examination was made in four cases. The membranes of the brain were found congested, and a considerable quantity of bloody serum escaped from the cut surface of the lungs. The heart was flabby, but its muscular substance did not appear altered. The most important changes were found in the lower part of the ileum, which was red externally, and on laying it open the mucous membrane was found of a dark red color, in patches, very friable, or if the disease were further advanced,

presenting patches of ulceration varying in size from that of a mustard-seed to a fourpenny-piece.

The writer enters into a long examination of the causes of the disease, far too long to admit of condensation here. It appears, however, to be clearly referable to the meat of which the persons partook, none having suffered who ate only bread and cheese, or butter, while persons who were not present at the festival, but who partook of the meat at their own homes, were affected. The animals appear to have been healthy, and their flesh seems to have been perfectly good when they were first killed, but to have become tainted by being kept for some days, after it was cooked, in an ill-ventilated cellar, while the hams were originally but imperfectly cured.—*Br. & For. Med. Rev. from Hufeland's Journal, May*, 1841.

On the employment of large Doses of Sulphate of Quinine in the Treatment of Typhoid Fever. By M. Saint Laurent.—Trials of the virtues of this remedy have been made at the Hopital Cochin by M. Blache, who was led to form a conclusion favorable to its employment in cases of typhoid fever. The cases, however, in which it was used were not numerous, and in some of them other remedies were given either before or in connection with the quinine. M. Broqua, of Plaisance, who first introduced this practice, coming to Paris, induced M. Husson to permit some of his patients at the Hopital Cochin to be subjected to this mode of treatment, and the results thus obtained are published by M. Laurent.

The dose of the medicine was usually ten centigrammes every hour; sometimes the dose was larger and administered less frequently; and in several instances the patients took more than ʒij. in every twenty-four hours for many days together. In thirteen cases no other remedy than the quinine was administered, but though the patients recovered, yet the results do not show any great superiority in this over other methods of treatment. In no instance were the symptoms cut short at once by the quinine, while in several cases the increased headache and thirst, and the greater dryness of the tongue which followed its use, were not only of importance in themselves, but rendered the cases more complicated, since it was not easy to tell how far those symptoms were produced by the medicine, or how far they betokened an aggravation of the disease. Of ten patients who had the disease mildly, all recovered but one, whose death M. Laurent attributes, apparently with justice, to the action of the quinine. Of three patients who were attacked by the disease in a severe form, one only recovered, and even he was for some time in a state of great danger, owing to hemorrhage from the intestines.

The cases are detailed in full, and are not by any means such as would impress one with a favorable opinion of the treatment proposed by M. Broqua. M. Laurent adds that M. Broqua is accustomed to administer the quinine in cases so slight that the patients would recover even though no treatment at all were adopted, and that if M. Husson had consented to its employment in such cases, the number of reputed cures from the sulphate of quinine would have been far greater. —*Br. & For. Med. Rev. from Archives Générales, Sept.* 1842.

SURGERY.

Subcutaneous Tenotomy not a New Thing.—In the "Ars Chirurgica, a Compendium of the Theory and Practice of Chirurgery, by W. Salmon, living at the great house by Black Friars Stairs, London," and published 1698, we find the following complete description of this modern operation. After describing the nature of wry neck, how it may arise from contraction either of the sternal or clavicular portion of the sterno-mastoid, as also the "old butcherly way of cure which puts the patient to great pain and danger," we have

"The cutting of a wry neck, by a new way without the hook. Here you must strongly take hold of the *chord* with your thumb and forefinger, with which feeling for the vessels (chiefly the *jugular vein* whose approximate is the *recurrent nerve*), you must carefully thrust it by; then having fast hold of the *chord* with your thumb and finger, you must warily thrust in your incision knife, as it were beyond the chord and just above your fingers; then making the patient hold up his head, the chord will be cut asunder, the outward skin remaining whole. Thus will the work be done with no more but a prick appearing outwardly, and the wound will be well in about twenty-four hours, without any effusion of blood."

MIDWIFERY AND DISEASES OF WOMEN AND CHILDREN.

Obstetrical Statistics in the Electorate of Hesse, by Dr. Schrieber.—From the accounts furnished from the clinical obstetric hospitals of Fulda, Marbourg, Dresden, Paria, Wurxbourg, Vienna, Berlin, and Breslau, it would appear that one operation is practised on a mean of 13 deliveries. At Vienna, the smallest number, 1 in 75; and at Berlin, the greatest, 1 in 6.3 to 6.8. At the hospital at Marbourg, in 1833-4, one operation for 15 deliveries; whilst taking the whole electorate of Hesse, during 1836, 7, and 8, the proportion was only 1 in 38. Hence it results, that the proportion of obstetrical operations performed throughout a whole province, that is, in private practice, is less than in hospitals; the same holds true as regards the city and the country. Thus in the cities of Hesse (Cassel and Hanan), one operation is performed in 17.9 deliveries, and in the country 1 in 95.

Cæsarian Section.—In the reports of the above-mentioned hospitals, this operation is to the others as 1 to 84; in the electorate of Hesse as 1 to 142. In the Berlin hospital it was performed once in every 256 cases, and thrice after death of the mother. In the electorate of Hesse, in 76,417 cases, it has been performed once on the living, and eleven times on the dead body.

Perforation.—In the Berlin hospital, with other operations, the proportion is 1 to 64.4; in Hesse, 1 to 74.

Turning.—By the head, in the Berlin hospital, once in 75 operations, and in Hesse once in 68. By the feet, once in 9 operations, in all the hospitals; once in 5, in that of Berlin; once in 32, in Hesse. There appears a remarkable difference between the number of cases where turning was performed between the country and city; on a mean, turning is per-

formed once in 103.2 cases, in Cassel and Hanan, while in the open country, immediately surrounding these towns, it is only once in 2068.

Application of the Forceps.—Once in 1.9 operations, in all the hospitals; once in 2.1, in Hesse. Once in 67.9 cases, in the cities (Cassel and Hanan), and once in 283 in the country.

It is evident, therefore, that in the large cities, and still more in the hospitals, there is much more resort to operations than in the country, where the physician is often at a distance, and where the friends dread the expense of an operation, and trust more to time and nature.

Forced Delivery.—Once in 28 operations in the hospitals; once in 80, in that of Berlin; and once in 313, in Hesse.

Extraction of the Placenta.—Once in 6.6 operations in the hospitals, and once in 5.7 in Hesse. As a general rule, three or four times the more operations are performed on women with their first children. The mortality consequent upon these operations, for the mother is 1 in 14.9 operations in the hospitals, and 1 in 15 in Hesse; for the child, 1 in 3.4 in the hospitals, and 1 in 2.4 in Hesse.—*Encyg. des Sci. Med. from Neue Zeitshrift fur Geburtskunde.*

Case of Metastasis of the Milk. By Dr. Rasi.—Ancilla Bassi, a robust peasant, æt. 27, nursed her child with much perseverance, although the nipples were from the beginning much chapped. Dr. Rasi prescribed weaning. Soon after, in consequence of divers imprudences, the secretion was arrested; at the same time she was attacked in the joints of the lower extremities with pains accompanied with fever. These were considered rheumatic, and an appropriate treatment directed. The joints, although painful, were neither reddened nor tender, which caused of course some doubt as regards the nature of the affection, when on the 17th day, after a general perspiration, the whole body was covered with a whitish miliary eruption; at the end of thirty hours this had become vesicular, the vesicles attaining the size of a lentile. This eruption lasted seven days, and a large quantity of the contained fluid was collected, bearing the most striking resemblance to milk.

A chemical analysis, by Sig. Muratori, gave the following. A white, opaque, odorless liquid, of a density greater than water, slightly reddening litmus paper, not coagulable by acids, and forming, with sulphuric ether, white flakes, which separated, and treated by the dilute chlorohydric and acetic acids, were perfectly dissolved, thus establishing their complete resemblance to human milk.

A portion left at a rest in an open vessel, separated into three distinct layers, the upper of a yellowish white, unctuous to the feel, almost completely soluble in sulphuric ether, and saporifable with caustic potass. The middle layer had the appearance of milk dissolved in water, and resembled completely the first milk secreted. The lowest one, adhering to the bottom of the vessel, resembled cheese, white, opaque, slightly acid, not oily to the feel, soluble in the chlorohydric and acetic acids.

A third portion was evaporated to dryness, and after calcination in a platinum crucible, upon analysis presented the sulphates found in human milk.

Dr. Pollini, also, with the aid of the microscope, established its complete resemblance to human milk.

Case of Tubarian Gestation, with Rupture of the Cyst containing the Embryo, &c. By R. M. Glover, M.D.—The subject of this case was aged 39, of stout habit; she had been married for the second time for three months. Since her marriage she had not menstruated, though previously she had been regular. During her first marriage she had three miscarriages, but never bore a viable child.

On the 30th of November, 1841, she complained of bearing-down pains in the back and abdomen, with slight bloody discharge from the vagina. On examination, the lips of the uterus were found rather tumefied, but close. The pulse was but little affected, the tongue clean. A gentle aperient and anodyne draught were administered, and the pains ceased. In the afternoon of the next day she had a similar attack, when the same treatment was renewed with equal success. This time a few fibrinous shreds were passed with the bloody discharge, which was very slight.

At 3 P. M., on the 2d of December, she was suddenly attacked with excruciating pain in the lower part of the abdomen. When seen by Mr. Dixon, she was in a state of collapse, extremities cold; rigors; lower part of the abdomen extremely painful on pressure; pulse about 80, scarcely perceptible; tongue clean. On examination, per vaginam, the lips of the uterus were found less tumid. A draught of laudanum and ether was ordered. Soon afterwards she had severe vomiting, a watery fluid being ejected from the stomach with great force. In the evening, when examined by Dr. Glover, in consultation with Mr. Dixon, she remained in much the same state. The abdomen was every where painful on pressure, especially inferiorly, where it had a doughy feel; superiorly, there was some tympanitis. Great pain was especially felt over the iliac fossæ. There was now no discharge from the vagina. The pupils were dilated, and the patient in a state of partial stupor.

The symptoms of depression continued to augment, she lay during the next day in a state of insensibility, and died at 6 P. M.

Post-mortem appearances.—No external sign of pregnancy was observed. On opening the peritoneum, a large clot was perceptible, occupying the space from the umbilicus in front downwards into the pelvis. The intestines exhibited some traces of inflammation. The pelvis and the iliac regions and posterior part of the abdomen contained a quantity of dark-colored fluid blood, estimated at about two pounds, while the clot might weigh three-quarters of a pound. No ruptured vessel could be detected, but a sac of the size of a walnut was found where the left Fallopian tube joined the uterus; its interior surface communicated with the peritoneum by an irregular shaggy opening, and by adherent clots, which could be pulled from openings resembling those of veins. The uterus and its appendages were carefully removed and examined subsequently.

The uterus was somewhat enlarged, and its lips slightly tumefied; on being opened, it was found to be lined by the decidua, apparently of very recent formation, to within three or four lines of its orifice. This membrane was red, soft and spongy, and terminated towards the mouth of the uterus by a somewhat elevated margin, which may be described as composed of striæ. Air could be injected from the right Fallopian tube into the uterus, but not from that of the left side, nor from the uterus into the cyst already alluded to. The left Fallopian tube was clearly connected

with this cyst, although impervious about four lines above it. The cyst has been already sufficiently described.

The left ovary was much shrunk, and a hydatid was observed attached to it. On its outer surface was a recent cicatrix, in which a minute dark clot could be observed. Near this, on section, two corpora lutea could be observed. The ovarian extremity of the left Fallopian tube was very open, and beautifully fimbriated.

The right ovary displayed two corpora lutea, and several Graafian vesicles.

Remarks.—Notwithstanding that the embryo was not found, in this case, being probably contained in the huge clot, there can scarcely be a doubt entertained of the nature of the case; and this being granted, the chief remarkable circumstance with regard to it is, the *early period* of gestation at which rupture of the sac took place.

In general, rupture of the sac in case of tubarian pregnancy takes place towards the third month. From the size of the sac in the present case, and the absence of marked symptoms of pregnancy, together with the recent formation of the decidua and state of the uterus, Dr. Glover would be inclined to consider the pregnancy as not more advanced than three weeks. It is by no means improbable that parallel cases are more frequent than is supposed.—*London and Edin. Monthly Jour. Med. Science.*

Hints on the Management of Infants.—There is so much good sense in a great part of M. Donné's work that we have been tempted to make several extracts from it, or rather to put upon paper our own ideas on the same subjects, and blend them with those of our author. There may be no novelty in them; but they are not for this reason the less useful.

Let us, for the present, take one point connected with the *feeding of infants.*

Whatever be the age of the infant, it is always of great utility that the food be given at regular periods, as nearly as possible equi-distant from each other, so that the stomach of the young creature is neither left too long empty, nor oppressed and unnecessarily loaded. A sufficient interval of time must therefore be allowed to elapse after each repast, to enable it to be digested and then discharged from the stomach before another be given. To put fresh food into the stomach, while it is still more or less filled with what had been taken before, is inevitably to disturb the process of assimilation, by which the food is converted into chyle for the nourishment and growth of the body.

Now this very simple circumstance—so simple that the experience of daily life dictates it, and withal so important that the health cannot be maintained without due attention to it—is, strange to say, very seldom attended to in the rearing of infants. How generally do we observe that, instead of giving food to them only at regular and stated periods, no sooner do they begin to cry, than they are immediately applied to the breast, although perhaps not half an hour had elapsed since they had had it to their little heart's content. It surely needs not the authority of a medical man to assure any one that such a practice cannot be wholesome or right.

We might derive a useful lesson on this point by watching the conduct of the lower animals towards their young. We do not, for example, observe that the cow will allow the calf, or the sheep the lamb, to be tugging

at the teat, whenever the young creature seems to wish it. It is only now and then, and at certain intervals, that they are allowed to satisfy themselves with the "milky food." We may be assured that nearly the same law applies to all animals, and that what holds good in case of the calf and of the lamb, holds good of the human infant also.

In one respect only have the dumb creatures in our fields the advantage over us, and it is this: with them, *instinct*—that truly marvellous gift of an all-wise and beneficent Creator—is an unerring guide, while man's boasted *reason* is, alas! often either asleep, or is leading him astray.

But it may be asked, how often then should the infant have the breast? The following few directions will, we think, suffice to direct our readers on this very important question. The younger that the infant is, the more frequent is the desire and necessity for food. During the first weeks of life, the breast may be given every two hours or so in the day—less frequently at night. As to the quantity which the child should have at each time, the nurse will, as a general remark, find that it may be allowed to continue sucking until it is satisfied. When once this is the case, all that is given afterwards, is only oppressive to the stomach; and it is well known that the little creature usually gets rid of the superfluity by bringing it up. When the child is very weak, it may be necessary to give the milk more frequently and in smaller qnantities at a time; but in ordinary cases an interval of about two or three hours should be allowed to elapse between each meal.

The child should, however, seldom be awaked for the purpose of giving food. It is an old saying, that "a sound sleep is almost as nourishing as a full feast;" and the remark is especially true of infants. They require a great deal of sleep, and they are always refreshed by it. As long as a child sleeps, we may rest pretty well assured that Nature does not need any fresh supply of food; and therefore to disturb it merely because the regular period, at which otherwise it would have been applied to the breast, has arrived, is not only unnecessary but hurtful. The exceptions to this remark occur very rarely indeed, and then only in the case of infants who are exceedingly weakly, and who should therefore be regularly seen by a medical man, as no general rule can be laid down that will be applicable to all.

It may be worth mentioning that, in not a few instances, the poverty of the nurse's milk seems to have something to do with excessive drowsiness of the infant. Nature appears to endeavor to compensate for the deficiency of nourishment by an extra allowance of repose. In all such cases, therefore, the medical man should satisfy himself most accurately on this point, more especially when the child is suckled by a hired nurse—who, it may be supposed, always tries to make us believe that her milk is both abundant and good. There is a simple rule, which will very seldom misguide us: it is this: if the child does not thrive properly and yet sleeps a great deal, we may feel pretty confident that the food administered is not sufficiently nutritious, and therefore that some change in the diet is necessary.

The frequency of suckling should be diminished after the sixth or seventh week, or even earlier in the case of robust hearty children. Once every three hours is then quite sufficient, provided the milk be duly nourishing, and the infant be allowed to satisfy its craving at each time. At the end of the third month, the breast need not be given oftener than every

four hours, and so on successively, an extra hour being added to each interval after every additional month or six weeks of life. By following this system, not only is the health of the infant best consulted, but the convenience and comfort of the nurse will be greatly promoted.

How many a mother, from an overflowing affection, devotes almost every hour of every day to watching over her beloved child! She is unwilling to leave her home for even a few hours, for fear of it suffering for want of the breast while she is away. Now this is just one of those errors, which it is the leading object of M. Donné's work to endeavor to get rid of, both for the mother's and the child's sake. If the latter be accustomed from its birth to have food only at stated regular times, it is altogether better in every respect that in the intervals the nurse be away, and the child be left in the care of another person. We have already explained how much the condition of the milk is affected by the state of the general health, and how necessary it is for the maintenance of this, that the nurse should take regular out-door exercise, and that her mind be kept in an equably cheerful state. Now how can these advantages be obtained, if she be continually from morning to night with her child? Another great evil of the nurse being too much with the infant, is that the latter, by the mere smell of the milk being constantly presented to it, is often induced to desire food when it certainly does not require it, and when, therefore, it would be much better without it.

This, it has always appeared to us, is one of the greatest disadvantages attending the nurse being too much with the infant—at least until it has been accustomed not to seek for the breast, except at stated intervals. And Nature is so flexible at this early period of life that this most desirable end may easily be gained by adopting a judicious plan from the commencement.—*Med. Chir. Review, Oct.* 1842.

On the Qualities of the Milk, and the Means of ascertaining them.—We need scarcely say that the old practice of judging of the qualities of a nurse's milk, by looking at a drop of it on the thumb-nail, is not to be depended upon: although some medical men still continue this practice with the view, we suppose, of satisfying popular prejudices.

Milk, we know, consists of several distinct constituent parts; some of them are dissolved like sugar in water, while others are in the solid form, and float through the fluid as minute particles or globules. The *soluble* ingredients are principally, 1, the caseum—the basis of cheese—2, a peculiar sort of saccharine matter; and, 3, various saline substances; the *insoluble* are only of one kind; viz. the fatty portion which produces butter. Milk may therefore be regarded as an emulsion or *looch*, in which the caseum, sugar and salts are dissolved, and the oil suspended through it in fine particles.

These various ingredients cannot be distinguished by the naked eye; but if a drop of milk be put on a watch-glass, and examined with a microscope of about 300 magnifying powers, we shall at once perceive a multitude of rounded, transparent, pearly-looking grains, floating in a limpid fluid: these are the globules of the milk, and it is they which constitute the butter obtained by churning. In pure unadulterated milk, we observe no other substance but these globules; varying much in dimensions, but all having the same general characters. It is therefore to be regarded as an unfavorable circumstance, if there be present any other particles besides the

proper milky globules—such as we find under certain circumstances which we shall presently mention.

The richness, and therefore the nutritive quality, of the milk, is pretty exactly represented by the number of globules which it contains; and in proportion as these abound, so usually does the quantity of the caseum and the sugary matter also.

It is therefore obvious, that the microscopic examination of the milk affords much very useful information; it only requires a little experience in the use of the instrument to satisfy any one of this. The difference between the milks of different women is sometimes most striking; in one there is an immense number of globules, all regular, well-formed, and of a good size; while in the other, they are small, sparse, and look like fine dust diffused through the liquid.

M. Donné assures us, that he has repeatedly compared the results obtained by microscopic examination of milk with those which chemical analysis of the fluid affords, and that they always agreed in their general characters: as a matter of course, there was more numerical exactitude in the latter way, but this extreme nicety is not required for the purposes of practical medicine.

The quantity of cream that forms upon milk is a simple and very useful means of determining its richness; this plan is scarcely applicable in the case of women. The cream is nothing but the coalescence of the milky globules, which, from being lighter than the medium in which they float, rise to the surface. M. Donné says that, according to his experiments, a healthy woman's milk yields about 3 per cent. of cream, while that of the ass gives one or two only, and that of the cow from ten to fifteen, or even twenty. This experiment is easily made with the aid of graduated tubes; but, however useful it may be as an auxiliary means, it should never supersede the employment of the microscope.

The Milk becomes thinner by remaining in the Breasts.—A distinguished chemist, M. Peligot, has shown, by a multitude of ingenious and very satisfactory experiments, that the longer the milk sojourns, after being once secreted, in the breasts, the more thin and watery it becomes. He says, that if the product of one *milking*—that is, all the milk which a cow, for example, yields at one time—is divided into three portions, by being received into three different vessels, the first milk is thinner than the second, and the second than the third, this being the most substantial of all.

This fact, indeed, is not unknown to many nurses, who have observed that the milk that first flows from their breasts in the morning, when perhaps they have not suckled during the whole of the preceding night, is thinner and more watery than what comes afterwards.

Formation of the Milk: the Colostrum.—We have already said that a milky fluid begins to be secreted by the mammæ, long before the birth of the child.

It is found on examination to contain milky globules which are more or less perfectly formed, united together in small masses, or heaps, by means of a mucous matter—and also corpuscles of a peculiar nature, which I have called granular bodies. The composition of this first milky seeretion does not alter immediately after delivery, and the colostrum, therefore, does not all at once become perfect milk. It becomes more abundant, it fills the mammæ, but we readily perceive by its yellowish color and its oleaginous appearance, that it is not genuine authentic milk.

The name of *colostrum* is therefore still retained; and it is generally believed to have slight purgative properties on the infant, and thus to promote the evacuation of the meconium.*

If such be the case, it is obvious that those children who are not suckled by their mothers, require some aperient medicine after birth more than those who are.

It is only after the milk fever has passed over, and after the infant has drawn the breast several times, that the mammary secretion acquires its characteristic properties, that it loses the oily and other strange elements, and no longer retains the viscid consistence and the yellow color, which it had at first. Even after the change to true milk has taken place, it will be found with the microscope to exhibit for several days a small quantity of the proper granular particles of the colostrum; the proportion of those gradually diminishes until, about the sixth or eighth day, they are no longer appreciable.

In some women, however, the milk does not lose the admixture of these granular corpuscles for weeks or even months, so that its secretion is never in a state of perfect purity. This condition—which, be it remembered, cannot be detected by the naked eye of the most practical observer—it is very important to ascertain, more especially when we have to select a nurse, for suckling. The following are M. Donné's observations on this subject.

"The presence of granular corpuscles in milk after a certain period is unquestionably to be regarded as an irregular and morbid condition; for we observe they are produced and become more and more numerous when the health of the nurse is deranged by disease, whether this be general or of the mamma itself. Thus, under the influence of fever, or of an engorgement of the gland itself, the milk, which may previously have been quite free from them, will often be found to exhibit their presence.

The effect of the change is in general very speedily observable on the health of the infant; it exhibits all the signs of being imperfectly nourished; it is puny, peevish, and uncomfortable; the bowels are generally relaxed, and the stools are seldom healthy."

* * * "The alteration of milk," adds our author, "by an admixture of the elements of the colostrum, is one of the conditions which will be found to be most generally coincident with the sickly state of infant health."

Chapped Nipples.—M. Donné is of opinion that this most troublesome and often most distressing complaint is, very often at least, connected with an altered state of the milk itself. The milk will, in many such cases, be found to be poor and watery, not very abundant, and to contain more or less of mucous matters. The child being imperfectly fed, and finding difficulty in drawing the milk, pulls at the nipple more than usual; and perhaps at the same time its saliva is more saline than usual, and thus contributes to increase the irritation.†—*Conseils aux Meres, &c.*

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* The meconium consists in a great measure of the intestinal mucus—the elements of which may be recognized with the aid of the microscope—and also of a certain portion of biliary matter.

† The chapped state of the nipples may be, and we have no doubt is, in many instances connected with some defect in the state of the milk itself; but this is certainly not always the case. The application of the weak solution of the sulphate of zinc, or of the tincture of catechu or kino, immediately after each act of suckling, will often speedily cause the fissures to heal; while the infant has at no time seemed to have suffered from the inconvenience to the mother.

MEMOIR OF DR. DOANE.

The following memoir has been received from a friend, with a request for its insertion in our pages.

George Bartlett Doane, M.D., the subject of this notice, was born in Boston, in the year of our Lord 1793. The family from which he descended had been merchants for several generations. His grandfather, Elisha Doane, of Wellfleet, had accumulated a large fortune in commerce and the fisheries, having early entered into the whale fishery. "At Wellfleet formerly lived Col. Elisha Doane, who amassed in this spot an estate of £120,000 sterling."* Thomas Boylston, of Boston, whose bequest to his native town secured his name to the public school-house on Fort Hill, and to the school for young children at the House of Industry, and Elisha Doane, of Wellfleet, were estimated by their fellow citizens the two richest men in the province of Massachusetts Bay. Isaiah Doane, the eldest son of Elisha, and the father of George, was educated at Harvard University, where he received his degree in 1774. He became a merchant, settled in Boston, married Hannah Bartlett, of Plymouth, a direct descendant from the Pilgrims, and carried on business largely as a shipping merchant, until British cruisers, at the commencement of the French Revolution, swept his ships from the ocean. A numerous family of children was the fruit of this marriage, viz. five sons and five daughters. George was the youngest of the sons. The loss of fortune, followed by the loss of health, and that again by early death on the part of the father, imposed on the widowed mother a care that called into exercise all the active virtues so characteristic of the pilgrim race. The mother, by example and precept, taught her children self-denial and activity. She gathered up the fragments, put her diminished fortune at nurse, retired to the country in the neighborhood of a good school, and there instructed her children in the lessons of practical wisdom. The widow's God and the father to the fatherless blessed the bereaved household. The unshrinking fortitude of the mother was not unobserved by our young school boy. He strove by diligence to recommend himself to his beloved parent. In 1808, at 15, he was admitted into Harvard University.

* Vol. III., p. 101, Dwight's Travels.

In 1812, at 19, he was graduated—a reputable scholar, in a class that now reflects honor on its Alma Mater. The severe mental labors of the mother in training unaided her numerous children, had impaired her health. The hope of contributing to the reinstatement of the health of his beloved mother, decided the young graduate in the choice of a profession. In the autumn of 1812, he accordingly entered on the study of medicine, resolved to study as a science what might contribute to gratify his ruling passion, filial piety, which sought the renovation of his mother's decayed strength. Although a succession of paralytic shocks experienced by the mother, interrupted his original purpose of becoming the instrument of her cure, still he untiringly devoted himself to the study of the elements of medicine, and never lost the opportunity to do good service at the bedside of the sick. Anatomy and morbid anatomy he studied with unwearied assiduity. His pupilage was filled up with self-denial and continued painful toil. He never flinched from duty while the cry of suffering was heard. Nights has he kept vigil at the bed-side of the poor, who had submitted to painful and perilous surgical operations, while the curative process was commencing. The lack of nursing among the sick poor always imposes heavy labor on the physician and the faithful student.

So decided had been his character as a faithful medical student and upright man, that one of the best educated physicians of his times, detailed on duty as a regimental surgeon to the militia detached for duty at South Boston, during an early period in the last war with Great Britain, selected and recommended him for a commission as his assistant surgeon. This tour of duty, though short, was faithfully performed by the young pupil. The officers of the regiment esteemed him as a gentleman and scholar, while the soldiers loved him as a skilful physician and kind friend. The odor of his good name reached the capital, and at the close of the year 1814, while yet in his pupilage, he received a commission as assistant surgeon in the U. S. Navy. In the spring of 1815, he was ordered to repair to the city of New York and report himself to Commodore Jones, who sent him on board the Macedonian, bound to the Mediterranean. On the voyage he writes, "Never was life so divested of all rational comfort as this." After a few days he writes again, "I read, write, and think as well in any situation, although the apartment I occupy is so far below the surface of the sea, that the rays of the sun never penetrate, thereby being entirely shut out from the light of heaven."

July 2d, 1815, he arrived at Gibraltar, where he was appointed acting surgeon on board the Constellation until her arrival at Port Mahon. This was the naval station for the American fleet, where a hospital was founded for the sick, to which Dr. M. Reynolds had been appointed as the surgeon, and Dr. Doane as the assistant surgeon. Dr. M. Reynolds had sailed, leaving to Dr. Doane the entire charge of the establishment for several months. On the return of Dr. M. Reynolds, Dr. Doane writes in his journal, "I have been more than three months entirely alone, the only responsible person here, and burdened with every thing, attending personally to every article of provision, medicine, clothing, purchasing and expending, paying all bills, examining all accounts, and at the expiration of every month, making a settlement of every thing, and having also by night and day the constant care of the sick, to prescribe and give all the medicine with my own hand; yet from habitual method, there is no confusion, no irregularity. This is a situation which calls forth and holds in exercise all the energies of my mind. I have also become engaged in quite an extensive practice among the poor, and as I attend them all gratis, between thirty and forty children are brought to me daily. They express much gratitude, and it is impossible to attend on the poor and sick without feeling for them the sincerest compassion. Here the poor never beg, except of God, and of him for patience only."

While on the tour of duty in the Mediterranean, smallpox broke out in the fleet, the cases of which were committed to the treatment of Dr. Doane on board the frigate United States, which was selected for quarantine. The sick were sent to the island of Minorca in this vessel. He thus describes in his journal his situation. "I have learned to accommodate myself to disappointment and privation, have entirely discarded from my thoughts all pleasure, and am now influenced by motives of improvement only." He proceeds. "I have now been in quarantine twenty-one days, with thirty-eight men and one midshipman sick of smallpox; many of them have had the disease to a most dreadful degree. I have had the good fortune to lose but three cases. On this island it is fatal to a most desolating extent. I have seen death and disease in all their varied forms, but never did I conceive of any thing so loathsome and disgusting. All disease here seems nothing compared to it; and as Burke says, all the horrors of sickness before known or heard of, seem mercy to this noxious havoc." He subsequently writes, "The sick are nearly all

recovered, and the term of quarantine has nearly expired. Yet, although confined to this small island, I am contented and happy, and find constant occupation with my sick and my studies." When Commodore Decatur, off Cape de Gatt, had crippled and conquered the Algerine fleet, Dr. Doane was ordered on board the Meeshauda, the flag ship of the enemy, to take charge of the wounded. Here his sympathies were well tried. The barbarous custom of inflicting corporeal punishment on criminals by the mutilation of their limbs, had awakened among the Algerines a horror of surgical operations, as badges of disgrace. These brave warriors preferred death to dishonor. Dr. Doane had much to encounter from this prejudice, as those whose mutilated limbs had been amputated reluctantly endured the dressings essential to the cure. With the zeal of an apostle he besought their patient endurance of the necessary treatment, and succeeded in disabusing their minds of their unnatural prejudices. When his kindness and skill had won them back to the love of life, their gratitude was unbounded. They besought him to accompany them to Algiers, where they promised him a life of ease, the great boon of existence in warm climates. Exemption from the necessity to labor, all men covet. In the low latitudes it is the *summum bonum* of human bliss. When the Dey of Algiers had ratified his treaty of peace between the Regency and the United States, dictated at the cannon's mouth by Commodore Decatur, the Algerine fleet was restored. Dr. Doane was then ordered to Carthagena, where he remained until the arrival of the U. S. Ship of the Line Independence and her squadron, when he accompanied them in their cruise to Leghorn and Pisa. At the latter place he mentions a valuable Medical Garden, with the following singular inscription on the gate at its entrance. "Enter with the eyes of Argus, but not with the hands of Briareus." The diligence, skill, and urbane manners of Dr. Doane had won for him the love and confidence of all observers. He had acquired a competent knowledge of the French, Spanish, and Italian languages to profit by the new scenes to which he had been introduced. His previous classical education had imbued his mind with a curiosity to see what had been said and sung by the historians and poets of Rome and Greece. His letters and his journal contain graphic descriptions of the interesting objects, both of nature and art, abounding in those countries, exhibiting great enthusiasm in the admiration of the sublime and beautiful. He returned from the Mediterranean in 1819, when he resigned his commission. His brother offi-

cers, under whose command he had sailed, bear testimony to his character in the following language. "Dr. Doane has been distinguished by his zeal, attention to the duties of his profession, and gentlemanly deportment." This is an extract of a letter of Captain W. M. Crane to the Secretary of the Navy, recommending him for promotion as a surgeon. In another letter he writes, "his skill, his correct gentlemanly deportment, secured him the respect and regard of his brother officers. He was several months the acting surgeon of our Naval Hospital at Port Mahon, in Minorca, and gave great satisfaction in the discharge of his duties." This letter is dated Gosport, Oct. 6th, 1820. Capt. John Shaw writes of him, the letter dated United States Ship Independence, Charlestown, Sept. 27th, 1820. "His skill, kindness and humanity were manifested in the arduous duties of an assistant hospital surgeon on a foreign station. The police and general good condition of the men under his charge, reflected credit on his exertions, and draws from me the expression of my high approbation of his official character and services while under my command." In 1820 Dr. Doane submitted to an examination for a degree as Doctor of Medicine, after which he commenced a practice in Boston, his native city. His well known good character had secured him the respect and good wishes of several among the eminent physicians of the town, as shown in a written recommendation, at the head of which stands the name of Samuel Danforth, the patriarch of the Faculty in Boston at that time. Dr. Doane was recommended to his neighbors and fellow citizens as a practitioner of medicine and surgery, and his humanity and skill while in the navy well declared the origin of the recommendation. The following is the concluding sentence in the recommendation.

"Diligence, decorum and integrity have uniformly characterized his manners and habits."

With such preparation and reputation, Dr. Doane did not wait long for opportunity to signalize himself. Two cases of gun-shot wounds fell under his treatment, both very severe, but were successfully treated by the young aspirant after professional fame. In one case a young man had attempted suicide by the discharge of a pistol under his chin, the contents of which passed up through the roof of his mouth and shattered the bones of the nose, as they had passed through that organ. In the other case, the accidental discharge of a rifle had thrown a bullet into the head through the external angle of the eye, without leaving any trace of its direction or

lodgement. The fortunate treatment of both cases secured the young surgeon reputation for skill in the several neighborhoods of their residence. Still, as the general surgery of Boston had been engrossed by his seniors strong in the confidence of the community, Dr. Doane turned his attention to a miscellaneous practice, in which he soon gained the confidence of the people. On the 12th of February, 1821, Dr. Doane was unanimously elected physician to the Boston Asylum for Indigent Boys. A further expression of the confidence of the community in Dr. Doane's professional character may be found in the records of the Trustees of the Massachusetts General Hospital, by whom he was unanimously chosen one of its consulting surgeons in February, 1837. Such were the delicacy of his manners and devotion to his cases, that he early acquired a large obstetrical practice, and practice among children. More than three thousand cases of midwifery are recorded on his books, between the commencement of his practice in 1820 and his death in 1842, which is an average of over one hundred and thirty-five per annum through the entire term. During seven years are recorded one thousand and seventy cases, which makes an annual average of more than one hundred and fifty-two cases. During his last three years of practice, more than six hundred cases are on record, which equals nearly four per week. The extent of his other practice taken into the account, it is a large practice in midwifery, although exceeded by the practice of some of his contemporaries during their most palmy days.

Dr. Doane was never married. His philanthropy, therefore, was more diffusive than otherwise it might have been. His sisters shared largely in their brother's affections, and participated freely in the fruits of his prosperity. The poor, particularly the sick poor, found in him a friend. His time, his labor and his money were freely employed in the effort to alleviate the condition of suffering humanity. His benevolence knew no limits in the effort to aid rising merit, and its onward struggles. So general had been his kindness to all within his reach, that he was universally hailed as a benefactor and philanthropist by his contemporaries. His generous labors literally wore him and broke him down. He visited patients on the very day preceding the night of his death. It is supposed that an affection of the heart, aggravated by unremitting professional toil, might have caused his sudden death. In a paroxysm of dyspnœa he had but just time to alarm a beloved sister, in whose arms he quietly breathed out his life. Medical aid had been summoned, but in vain.

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